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<120> COMPOSITIONS AND METHODS FOR THE THERAPEUTIC USE OF AN ATONAL-  
ASSOCIATED SEQUENCE FOR DEAFNESS, OSTEOARTHRITIS, AND ABNORMAL CELL  
PROLIFERATION

<130> HO-P01899US2/09906355/OTA 99-47

<140> US 09/585,645

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<151> 1999-06-01

<150> US 60/176,993

<151> 2000-01-19

<150> PCT/US00/15410

<151> 2000-06-01

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<170> PatentIn version 3.0

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| ttgcaggcga | gagagcatcc | cgtctacccg | cctgagctgt | ccctcctgga  | cagcacccgac | 180 |
| ccacgcgcct | ggctggctcc | cactttgcag | ggcatctgca | cggcacgcgc  | cgcccagtat  | 240 |
| ttgctacatt | ccccggagct | gggtgcctca | gaggccgctg | cgccccggga  | cgaggtggac  | 300 |
| ggccgggggg | agctggtaag | gaggagcagc | ggcggtgcca | gcagcagcaa  | gagccccggg  | 360 |
| ccggtgaaag | tgcggaaca  | gctgtgcaag | ctgaaaggcg | gggtggtggt  | agacgagctg  | 420 |
| ggctgcagcc | gccaacgggc | cccttccagc | aaacaggtga | atgggggtgca | gaagcagaga  | 480 |
| cggctagcag | ccaacgccag | ggagcggcgc | aggatgcatg | ggctgaacca  | cgccttcgac  | 540 |
| cagctgcgca | atgttatccc | gtcgttcaac | aacgacaaga | agctgtccaa  | atatgagacc  | 600 |
| ctgcagatgg | cccaaata   | catcaacgcc | ttgtccgagc | tgctacaaac  | gcccagcgga  | 660 |
| ggggaacagc | caccgcgcgc | tccagcctcc | tgcaaaagcg | accaccacca  | ccttcgcacc  | 720 |
| gcggcctcct | atgaaggggg | cgcgggcaac | gcgaccgcag | ctggggctca  | gcaggcttcc  | 780 |

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| Met | Ser | Arg | Leu | Leu | His | Ala | Glu | Glu | Trp | Ala | Glu | Val | Lys | Glu | Leu | 1   | 5   | 10  | 15  |
| Gly | Asp | His | His | Arg | Gln | Pro | Gln | Pro | His | His | Leu | Pro | Gln | Pro | Pro | 20  | 25  | 30  |     |
| Pro | Pro | Pro | Gln | Pro | Pro | Ala | Thr | Leu | Gln | Ala | Arg | Glu | His | Pro | Val | 35  | 40  | 45  |     |
| Tyr | Pro | Pro | Glu | Leu | Ser | Leu | Leu | Asp | Ser | Thr | Asp | Pro | Arg | Ala | Trp | 50  | 55  | 60  |     |
| Leu | Ala | Pro | Thr | Leu | Gln | Gly | Ile | Cys | Thr | Ala | Arg | Ala | Ala | Gln | Tyr | 65  | 70  | 75  | 80  |
| Leu | Leu | His | Ser | Pro | Glu | Leu | Gly | Ala | Ser | Glu | Ala | Ala | Ala | Pro | Arg | 85  | 90  | 95  |     |
| Asp | Glu | Val | Asp | Gly | Arg | Gly | Glu | Leu | Val | Arg | Arg | Ser | Ser | Gly | Gly | 100 | 105 | 110 |     |
| Ala | Ser | Ser | Ser | Lys | Ser | Pro | Gly | Pro | Val | Lys | Val | Arg | Glu | Gln | Leu | 115 | 120 | 125 |     |
| Cys | Lys | Leu | Lys | Gly | Gly | Val | Val | Val | Asp | Glu | Leu | Gly | Cys | Ser | Arg | 130 | 135 | 140 |     |
| Gln | Arg | Ala | Pro | Ser | Ser | Lys | Gln | Val | Asn | Gly | Val | Gln | Lys | Gln | Arg | 145 | 150 | 155 | 160 |
| Arg | Leu | Ala | Ala | Asn | Ala | Arg | Glu | Arg | Arg | Arg | Met | His | Gly | Leu | Asn | 165 | 170 | 175 |     |
| His | Ala | Phe | Asp | Gln | Leu | Arg | Asn | Val | Ile | Pro | Ser | Phe | Asn | Asn | Asp | 180 | 185 | 190 |     |
| Lys | Lys | Leu | Ser | Lys | Tyr | Glu | Thr | Leu | Gln | Met | Ala | Gln | Ile | Tyr | Ile | 195 | 200 | 205 |     |
| Asn | Ala | Leu | Ser | Glu | Leu | Leu | Gln | Thr | Pro | Ser | Gly | Gly | Glu | Gln | Pro | 210 | 215 | 220 |     |

Pro Pro Pro Pro Ala Ser Cys Lys Ser Asp His His His Leu Arg Thr  
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 Ala Ala Ser Tyr Glu Gly Gly Ala Gly Asn Ala Thr Ala Ala Gly Ala  
 245 250 255  
 Gln Gln Ala Ser Gly Gly Ser Gln Arg Pro Thr Pro Pro Gly Ser Cys  
 260 265 270  
 Arg Thr Arg Phe Ser Ala Pro Ala Ser Ala Gly Gly Tyr Ser Val Gln  
 275 280 285  
 Leu Asp Ala Leu His Phe Ser Thr Phe Glu Asp Ser Ala Leu Thr Ala  
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 305 310 315 320  
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 gaggaggagg acgaggagct gcgccggccg ggctccgcgc gtgggcagcg tggagcggaa 300  
 gccgggcagg ggggtgcagg cagtccggcg tcgggtgcct ggggttgccg gacagggcgg 360  
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| Met | Ala | Pro | His | Pro | Leu | Asp | Ala | Leu | Thr | Ile | Gln | Val | Ser | Pro | Glu | 1   | 5   | 10  | 15  |
| Thr | Gln | Gln | Pro | Phe | Pro | Gly | Ala | Ser | Asp | His | Glu | Val | Leu | Ser | Ser | 20  | 25  | 30  |     |
| Asn | Ser | Thr | Pro | Pro | Ser | Pro | Thr | Leu | Ile | Pro | Arg | Asp | Cys | Ser | Glu | 35  | 40  | 45  |     |
| Ala | Glu | Val | Gly | Asp | Cys | Arg | Gly | Thr | Ser | Arg | Lys | Leu | Arg | Ala | Arg | 50  | 55  | 60  |     |
| Arg | Gly | Gly | Arg | Asn | Arg | Pro | Lys | Ser | Glu | Leu | Ala | Leu | Ser | Lys | Gln | 65  | 70  | 75  | 80  |
| Arg | Arg | Ser | Arg | Arg | Lys | Lys | Ala | Asn | Asp | Arg | Glu | Arg | Asn | Arg | Met | 85  | 90  | 95  |     |
| His | Asn | Leu | Asn | Ser | Ala | Leu | Asp | Ala | Leu | Arg | Gly | Val | Leu | Pro | Thr | 100 | 105 | 110 |     |
| Phe | Pro | Asp | Asp | Ala | Lys | Leu | Thr | Lys | Ile | Glu | Thr | Leu | Arg | Phe | Ala | 115 | 120 | 125 |     |
| His | Asn | Tyr | Ile | Trp | Ala | Leu | Thr | Gln | Thr | Leu | Arg | Ile | Ala | Asp | His | 130 | 135 | 140 |     |
| Ser | Phe | Tyr | Gly | Pro | Glu | Pro | Pro | Val | Pro | Cys | Gly | Glu | Leu | Gly | Ser | 145 | 150 | 155 | 160 |
| Pro | Gly | Gly | Gly | Ser | Asn | Gly | Asp | Trp | Gly | Ser | Ile | Tyr | Ser | Pro | Val | 165 | 170 | 175 |     |
| Ser | Gln | Ala | Gly | Asn | Leu | Ser | Pro | Thr | Ala | Ser | Leu | Glu | Glu | Phe | Pro | 180 | 185 | 190 |     |
| Gly | Leu | Gln | Val | Pro | Ser | Ser | Pro | Ser | Tyr | Leu | Leu | Pro | Gly | Ala | Leu | 195 | 200 | 205 |     |

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| Met | Phe | Val | Lys | Ser | Glu | Thr | Leu | Glu | Leu | Lys | Glu | Glu | Glu | Glu | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Met | Leu | Leu | Gly | Ser | Ala | Ser | Pro | Ala | Ser | Ala | Thr | Leu | Thr | Pro |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Met | Ser | Ser | Ser | Ala | Asp | Glu | Glu | Glu | Asp | Glu | Glu | Leu | Arg | Arg | Pro |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Ser | Ala | Arg | Gly | Gln | Arg | Gly | Ala | Glu | Ala | Gly | Gln | Gly | Val | Gln |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gly | Ser | Pro | Ala | Ser | Gly | Ala | Gly | Gly | Cys | Arg | Pro | Gly | Arg | Leu | Leu |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Gly | Leu | Met | His | Glu | Cys | Lys | Arg | Arg | Pro | Ser | Arg | Ser | Arg | Ala | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Arg | Gly | Ala | Lys | Thr | Ala | Glu | Thr | Val | Gln | Arg | Ile | Lys | Lys | Thr |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Arg | Leu | Lys | Ala | Asn | Asn | Arg | Glu | Arg | Asn | Arg | Met | His | Asn | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Asn | Ala | Ala | Leu | Asp | Ala | Leu | Arg | Glu | Val | Leu | Pro | Thr | Phe | Pro | Glu |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asp | Ala | Lys | Leu | Thr | Lys | Ile | Glu | Thr | Leu | Arg | Phe | Ala | His | Asn | Tyr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ile | Trp | Ala | Leu | Thr | Glu | Thr | Leu | Arg | Leu | Ala | Asp | His | Cys | Ala | Gly |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ala | Gly | Gly | Leu | Gln | Gly | Ala | Leu | Phe | Thr | Glu | Ala | Val | Leu | Leu | Ser |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Pro | Gly | Ala | Ala | Leu | Gly | Ala | Ser | Gly | Asp | Ser | Pro | Ser | Pro | Pro | Ser |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Trp | Ser | Cys | Thr | Asn | Ser | Pro | Ala | Ser | Ser | Ser | Asn | Ser | Thr | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |
| Pro | Tyr | Ser | Cys | Thr | Leu | Ser | Pro | Ala | Ser | Pro | Gly | Ser | Asp | Val | Asp |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Trp | Gln | Pro | Pro | Pro | Pro | Glu | Lys | His | Arg | Tyr | Ala | Pro | His | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Pro | Leu | Ala | Arg | Asp | Cys | Ile |     |     |     |     |     |     |     |     |     |
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| aagaaccatg ttaacactac cgtttgacga gtctgtcgta atgcccgaat ccagatgtg   | 180  |
| cagaaagttt gctagacaat gtgaggacca gaaacaaatt aagaaaccag agagctttcc  | 240  |
| aaaacaagtt gtccttcgag gaaagagcat taaaagggcc cctggagaag aaaccgagaa  | 300  |
| agaagaggag gaagaagaca gagaggaaga agatgagaat ggcttgtcca gaaggagggg  | 360  |
| gctcaggaaa aaaaagacca ccaaactacg actggaaagg gtcaagttca ggagacagga  | 420  |
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| aaaagtggtc ccctgttact ctaaaaccca aaaactgtcc aaaatagaaa ctttacgact  | 540  |
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| aggctgctta cagctcaacg ccagaagttt cctgatgggt caggggtggg aggctgccc   | 720  |
| ccacacaagg tcaccctact ccacattcta cccaccctac cacagccctg agctggccac  | 780  |
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| cttggactat ggcaaaaatt acaattatgg catgcattac tgtgcagtgc caccagggg   | 1020 |
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| acatctgcgc agccaatctc tcactatgca agatgaatta aatgcagttt ttcataatta  | 1140 |
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| catacttcaa tgtctatttc agttgtacag ttatgatgaa aatgcatgtt ataaaaatca  | 1560 |
| gatgagtaaa atgtgtttat aattactagg attcatatat gtatctctga aattttagtt  | 1620 |
| tttaaaatat taagagctaa ccatgaaatt aaaaggtgca tttggggatg cacaacggta  | 1680 |
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| aactattcct cttcaagcat tttcagagga ggaaacacgg tatttggggg aggttatcag  | 1800 |

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| Met | Leu | Thr | Leu | Pro | Phe | Asp | Glu | Ser | Val | Val | Met | Pro | Glu | Ser | Gln | 1   | 5   | 10  | 15  |
| Met | Cys | Arg | Lys | Phe | Ala | Arg | Gln | Cys | Glu | Asp | Gln | Lys | Gln | Ile | Lys | 20  | 25  | 30  |     |
| Lys | Pro | Glu | Ser | Phe | Pro | Lys | Gln | Val | Val | Leu | Arg | Gly | Lys | Ser | Ile | 35  | 40  | 45  |     |
| Lys | Arg | Ala | Pro | Gly | Glu | Glu | Thr | Glu | Lys | Glu | Glu | Glu | Glu | Glu | Asp | 50  | 55  | 60  |     |
| Arg | Glu | Glu | Glu | Asp | Glu | Asn | Gly | Leu | Ser | Arg | Arg | Arg | Gly | Leu | Arg | 65  | 70  | 75  | 80  |
| Lys | Lys | Lys | Thr | Thr | Lys | Leu | Arg | Leu | Glu | Arg | Val | Lys | Phe | Arg | Arg | 85  | 90  | 95  |     |
| Gln | Glu | Ala | Asn | Ala | Arg | Glu | Arg | Asn | Arg | Met | His | Gly | Leu | Asn | Asp | 100 | 105 | 110 |     |
| Ala | Leu | Asp | Asn | Leu | Arg | Lys | Val | Val | Pro | Cys | Tyr | Ser | Lys | Thr | Gln | 115 | 120 | 125 |     |
| Lys | Leu | Ser | Lys | Ile | Glu | Thr | Leu | Arg | Leu | Ala | Lys | Asn | Tyr | Ile | Trp | 130 | 135 | 140 |     |
| Ala | Leu | Ser | Glu | Ile | Leu | Arg | Ile | Gly | Lys | Arg | Pro | Asp | Leu | Leu | Thr | 145 | 150 | 155 | 160 |
| Phe | Val | Gln | Asn | Leu | Cys | Lys | Gly | Leu | Ser | Gln | Pro | Thr | Thr | Asn | Leu | 165 | 170 | 175 |     |
| Val | Ala | Gly | Cys | Leu | Gln | Leu | Asn | Ala | Arg | Ser | Phe | Leu | Met | Gly | Gln | 180 | 185 | 190 |     |
| Gly | Gly | Glu | Ala | Ala | His | His | Thr | Arg | Ser | Pro | Tyr | Ser | Thr | Phe | Tyr | 195 | 200 | 205 |     |
| Pro | Pro | Tyr | His | Ser | Pro | Glu | Leu | Ala | Thr | Pro | Pro | Gly | His | Gly | Thr | 210 | 215 | 220 |     |
| Leu | Asp | Asn | Ser | Lys | Ser | Met | Lys | Pro | Tyr | Asn | Tyr | Cys | Ser | Ala | Tyr | 225 | 230 | 235 | 240 |
| Glu | Ser | Phe | Tyr | Glu | Ser | Thr | Ser | Pro | Glu | Cys | Ala | Ser | Pro | Gln | Phe | 245 | 250 | 255 |     |



Glu Gly Pro Leu Ser Pro Pro Pro Ile Asn Tyr Asn Gly Ile Phe Ser  
                   260                                  265                                  270  
 Leu Lys Gln Glu Glu Thr Leu Asp Tyr Gly Lys Asn Tyr Asn Tyr Gly  
                   275                                  280                                  285  
 Met His Tyr Cys Ala Val Pro Pro Arg Gly Pro Leu Gly Gln Gly Ala  
                   290                                  295                                  300  
 Met Phe Arg Leu Pro Thr Asp Ser His Phe Pro Tyr Asp Leu His Leu  
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 Arg Ser Gln Ser Leu Thr Met Gln Asp Glu Leu Asn Ala Val Phe His  
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Asn

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<212> PRT  
<213> MOUSE

<400> 11

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Ser | Arg | Leu | Leu | His | Ala | Glu | Glu | Trp | Ala | Glu | Val | Lys | Glu | Leu |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |
| Gly | Asp | His | His | Arg | His | Pro | Gln | Pro | His | His | Val | Pro | Pro | Leu | Thr |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Pro | Gln | Pro | Pro | Ala | Thr | Leu | Gln | Ala | Arg | Asp | Leu | Pro | Val | Tyr | Pro |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Ala | Glu | Leu | Ser | Leu | Leu | Asp | Ser | Thr | Asp | Pro | Arg | Ala | Trp | Leu | Thr |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Pro | Thr | Leu | Gln | Gly | Leu | Cys | Thr | Ala | Arg | Ala | Ala | Gln | Tyr | Leu | Leu |  |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |  |
| His | Ser | Pro | Glu | Leu | Gly | Ala | Ser | Glu | Ala | Ala | Ala | Pro | Arg | Asp | Glu |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Ala | Asp | Ser | Gln | Gly | Glu | Leu | Val | Arg | Arg | Ser | Gly | Cys | Gly | Gly | Leu |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Ser | Lys | Ser | Pro | Gly | Pro | Val | Lys | Val | Arg | Glu | Gln | Leu | Cys | Lys | Leu |  |
|     |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Lys | Gly | Gly | Val | Val | Val | Asp | Glu | Leu | Gly | Cys | Ser | Arg | Gln | Arg | Ala |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     |     | 140 |     |     |     |  |
| Pro | Ser | Ser | Lys | Gln | Val | Asn | Gly | Val | Gln | Lys | Gln | Arg | Arg | Leu | Ala |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Ala | Asn | Ala | Arg | Glu | Arg | Arg | Arg | Met | His | Gly | Leu | Asn | His | Ala | Phe |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |
| Asp | Gln | Leu | Arg | Asn | Val | Ile | Pro | Ser | Phe | Asn | Asn | Asp | Lys | Lys | Leu |  |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |  |
| Ser | Lys | Tyr | Glu | Thr | Leu | Gln | Met | Ala | Gln | Ile | Tyr | Ile | Asn | Ala | Leu |  |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |  |
| Ser | Glu | Leu | Leu | Gln | Thr | Pro | Asn | Val | Gly | Glu | Gln | Pro | Pro | Pro | Pro |  |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |  |
| Thr | Ala | Ser | Cys | Lys | Asn | Asp | His | His | His | Leu | Arg | Thr | Ala | Ser | Ser |  |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |  |
| Tyr | Glu | Gly | Gly | Ala | Gly | Ala | Ser | Ala | Val | Ala | Gly | Ala | Gln | Pro | Ala |  |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |  |
| Pro | Gly | Gly | Gly | Pro | Arg | Pro | Thr | Pro | Pro | Gly | Pro | Cys | Arg | Thr | Arg |  |
|     |     |     | 260 |     |     |     |     | 265 |     |     |     |     | 270 |     |     |  |
| Phe | Ser | Gly | Pro | Ala | Ser | Ser | Gly | Gly | Tyr | Ser | Val | Gln | Leu | Asp | Ala |  |
|     |     | 275 |     |     |     |     | 280 |     |     |     |     | 285 |     |     |     |  |

Leu His Phe Pro Ala Phe Glu Asp Arg Ala Leu Thr Ala Met Met Ala  
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Gln Lys Asp Leu Ser Pro Ser Leu Pro Gly Gly Ile Leu Gln Pro Val  
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Gln Glu Asp Asn Ser Lys Thr Ser Pro Arg Ser His Arg Ser Asp Gly  
 325 330 335

Glu Phe Ser Pro His Ser His Tyr Ser Asp Ser Asp Glu Ala Ser  
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 ccgggctctt atggaatgct cggaacctta actgaagagc atgacagtat tgaggaggat 180  
 gaagaagagg aagaagatgg agataaacct aaaagaagag gtcccaagaa aaagaagatg 240  
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 tggtaaactt aagtgaatat atttgatggt ttgaggccac atggtaatag aacagaaaga 1260

|  |      |
|--|------|
| aagcccaggc cctgttccaa tggtgccaaa gattaattga atgctctgcc aattaacttt    | 1320 |
| ccattttccag tgttttttatt gcttttctgat aaacatgaag caactgttcc aaatcaacat | 1380 |
| ataccttttca cctcccacac attttttaa ataaaaagcaa tcaaagcaaa tagcaaaaat   | 1440 |
| ggaatgatta tacagaaagt gaaggagcat caagtacatg tctgttggct tatagaatac    | 1500 |
| aaaatttgtg tgaatttgac aaatcatctt tgtgtctatt taaatataac ttccagagcc    | 1560 |
| taaaataata acttggatgt taccataaat aaccagtatg ttctttaaga gatcagctct    | 1620 |
| acttattact gtgctgaaag gtatacacac cttttttagt gattggagaa ccatgataga    | 1680 |
| agcctcacac aaacttttatt cttttatacta tttaaaaaac aactgtctta gtactaggag  | 1740 |
| acaagcaaga aagacattga aatttctctt ctggcacaca gaaatatcac ctagctcatt    | 1800 |
| tcttagctcc cgtgactata gggctgtaga attttgcagg tattcaggtg cttcagttag    | 1860 |
| aatcagaact cagccaggtt catactgtag agcaataaaa tggtggttgg ctgctatccc    | 1920 |
| aactaacaca gttaaagaac tctgcctcac acatagccac tggaaaaatg tggatattct    | 1980 |
| ccagcaagat gaatttcact gtttaaagca atgcaattaa agccatagag tttcgtccac    | 2040 |
| tccagtatca tatattccag aactgttgta atcaatcttg aattcttaca acataaatgc    | 2100 |
| aactccttac ttcccaccta aactgattg ttatatgtc ttcaattcca agatattatg      | 2160 |
| caattatatg caaaattttg attagaatca aaattaagag tcaatgaatc tgtctgtatc    | 2220 |
| ttcaggacgg gttttgatca gttttaagaa agtttatttt cttttatgtg gcatctcttt    | 2280 |
| tctttgtaac cacactgggt cagccaagtt tctcttctcc agagaaatta gctctgagaa    | 2340 |
| attttactat catgatccat cttccacagc aattatttag gttcaactca agagtataca    | 2400 |
| tagtttattt atagtgggtg aggatacacc tccaagaata aattttaaca acattaatga    | 2460 |
| catatgaata tgccatttta tctaccaaac tatatatgta tctcttttct ttattgcctt    | 2520 |
| tatttatttc ttcacactga gagttatttt gtgtccatct tattgcagca cttactctgc    | 2580 |
| tctactttgc acctttggat tataaatatg tttaaaagtc tgtaaagacg tcttaaacaa    | 2640 |
| ctcgtgacag taattcacca cccctaagac cttgaatcac cctagtggaa ataggcaagg    | 2700 |
| agaattattt atagaatcat cctatgtaat tttttttgag aatttgctct acctagcatt    | 2760 |
| tatgtttata gataattgct atctgcatta tttattaggt tctatttatt taatttatct    | 2820 |
| ttctttcttt ttatgtaaac atttgtgccc catagatata gcctcaaagc ttcactggga    | 2880 |
| aactagctta tatgtttgga gtgagagaaa aggagaaaat cagttcttga ttgcttgcaa    | 2940 |
| tggttttata aaacagagca ataatttgaa tagatatgca acttaatggg tttagaattt    | 3000 |
| ttcctttaag gtgcaacaga gttacattat tatttatgac tttggagaat gtagtacatg    | 3060 |
| tgaaccagga ctgtaggctt gtgaagagag attttataat taaatacaaa tttagtactg    | 3120 |

|   |      |
|---|------|
| tactatgctt ggaaagaact tggtctttaa ataatgttta gtcttctggg agtgttttca | 3180 |
| gataaaatga agcaattggt taaaagaaat ggctgttttc cctccctttt ccagtagcaa | 3240 |
| taaagctttg agtgttatta c   | 3261 |

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<210> 13
<211> 501
<212> DNA
<213> ZEBRA FISH
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<221> misc_feature
<222> (115)..(115)
<223> "n" can be any nucleotide

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| ttcacgcgtc aggaagacgt ccggacactc agcagcgccg agtcaagga ggcanaggac   | 120 |
| gacaacacgg acagggagga ggaggaggag agagaggagg actataacgg gctgccaaag  | 180 |
| aagaagggtc cccgcaaaaa gaaatccgag ggacgcggtg accgagtcaa aatgcgcogt  | 240 |
| caggaagcaa acgcgcgtga gcgcagccgc atgcacggtc taaacgacgc gctcgaaagc  | 300 |
| ctgcgcaaag tcgtgccgtg ctactccaaa acgcagaaac tctccaagat cgaaaccctg  | 360 |
| gggctgggca agaattacat ttgggctctg tctgagactt tgagcgcagg aaagcgacct  | 420 |
| ggcctgcttg ggttggttagc aaccctgggc gtgggctggt ctagaggaca gaccagcttg | 480 |
| gtgggggagt gcctgcagct a  | 501 |

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<210> 14
<211> 609
<212> DNA
<213> HUMAN

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| <400> 14  |     |
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| gttcaaacia attaaataag tttaaaagaa aattaaaaag aaaaaaatct ttccagtaga | 120 |
| aacagaatca cagtgtttca cagacaaaag gaaaggaaaa gaagttctca tacgaaaaga | 180 |
| gatttattat tacatagaaa attctcacia tagttgaaac aacttcaga aactagtaaa  | 240 |
| caccttagat agagttgtgc caattactca gccacaagc atctgctttg tcttaattag  | 300 |
| acaggggagg tgaatgacca ctgtttattt tcattttcct cattaattat gaaaaactgc | 360 |
| atttaattca tcttgcatgtg tgagagattg gctgcgaga tgtaagtcgt aagggaagtg | 420 |
| gctgtcggtg ggcaacctga acatggcacc ctgcccaagg ggacccttg gtggcactgc  | 480 |

acagtaatgc atgccgtaat tgtaatTTTT accatagtcc aaggTTTctt cttgcttcag 540  
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<210> 15  
 <211> 675  
 <212> DNA  
 <213> HUMAN

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 aactaccgt ttgatgagtc tgttgtaatg ccagaatccc agatgtgcag aaagTTTTct 180  
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 atctgggcac tgtctgatat gctgagaatc ggcaagagac cagatctgct caggattcgg 600  
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 ctcaacgaca ggagt 675

<210> 16  
 <211> 1476  
 <212> DNA  
 <213> DROSPHILA

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 gtgcctggcg cgagagagat gacaacaggc gaagtgtagg cgtttcacca ccgagcgaaa 180

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gggagggaaa catatctaac centaaagtca cccagntcc tcggggagat cttttggccg      240
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aacttggtca gaacggcggg gaaaatatatt gtagaatgca tctcgcgggg gttgaccgta      360
gtcaagtctg gatccgatcg gatcgtttca gttgcaacga aactttcaag ccgcgcggat      420
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cggtcagaa gagaagacga caggctgcca atgcgcggga aaggaagcgg atgaatggat      780
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gtgattttct tcttactgta gattaagtta aatatgtaat gaaataaatt gaaatgttta     1080
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gtagcgtgac acccctgaac tcctggccag aactcctctc attgaataaa aaaggcagct     1440
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<211> 189
<212> PRT
<213> DROSOPHILA

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<400> 17

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Tyr Leu Gly Ser Pro Asn Tyr Asn Leu Thr Gln Leu Pro Pro Val Ser
20          25          30

Gly Gln Asp Tyr Gly Gln Gly Ala Phe Leu Ser Pro Glu Trp Gln Phe
35          40          45

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Leu Asp Ala Ala Gly Gly Thr Gln Thr Glu Leu Gly Pro Ile Met Glu  
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 65 70 75 80  
 Ser Thr Gly Ser Asp Gly Arg Lys Ser Ser Pro Glu Gln Thr Asn Leu  
 85 90 95  
 Ser Pro Thr Val Gln Lys Arg Arg Arg Gln Ala Ala Asn Ala Arg Glu  
 100 105 110  
 Arg Lys Arg Met Asn Gly Leu Asn Ala Ala Phe Glu Arg Leu Arg Glu  
 115 120 125  
 Val Val Pro Ala Pro Ser Ile Asp Gln Lys Leu Ser Lys Phe Glu Thr  
 130 135 140  
 Leu Gln Met Ala Gln Ser Tyr Ile Leu Ala Leu Cys Asp Leu Leu Asn  
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 180 185

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 <211> 1074  
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gccgctagcc ctgcccgtgc gtgtctccgt cccccccac cttctccgta tcccgttgca 900  
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 ccgcctcggt ttccatacga cttggaaaac ccggcaaaga aaagcgacag atttgctgcc 1020  
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 <212> PRT  
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<400> 19

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 35 40 45  
 Asp Arg Glu Arg Asn Arg Met His His Leu Asn Ala Ala Leu Asp Glu  
 50 55 60  
 Leu Arg Ser Val Leu Pro Thr Phe Pro Asp Asp Thr Lys Leu Thr Lys  
 65 70 75 80  
 Ile Glu Thr Leu Arg Phe Ala Tyr Asn Tyr Ile Trp Ala Leu Ser Glu  
 85 90 95  
 Thr Leu Arg Leu Ala Glu Gln Cys Leu Pro Pro Pro Pro Ala Phe Arg  
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 Gly Pro Pro Ala Pro Pro Ser Pro Gly Ser Asp Ala Gly Ser Trp Leu  
 115 120 125  
 Ser Ser Gly Ser Pro Ala Ala Pro Ser Leu Cys Ala Ser Ala Ser Gly  
 130 135 140  
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 Ala Leu Arg Ala Phe Arg Gly Leu Pro Pro Ala Ala Pro Gly Ala Pro  
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Cys Arg

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<400> 21

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20        25        30

Ser Ala Gly Glu Glu Asp Glu Asp Glu Glu Asp Gly Arg Pro Arg Arg
35        40        45

Leu Gln Glu Gly Ala Arg Arg Ala Gly Arg Gln Arg Gly Pro Pro Arg
50        55        60

Ala Ala Arg Thr Ala Glu Thr Ala Gln Arg Ile Lys Arg Ser Arg Arg
65        70        75        80

Leu Lys Ala Asn Asn Arg Glu Arg Asn Arg Met His Asn Leu Asn Ala
85        90        95

Ala Leu Asp Ala Leu Arg Asp Val Leu Pro Thr Phe Pro Glu Asp Ala
100       105       110

Lys Leu Thr Lys Ile Glu Thr Leu Arg Phe Ala His Asn Tyr Ile Trp
115      120      125

Ala Leu Thr Glu Thr Leu Arg Leu Ala Gly Ala Ala Arg Leu Gly Gly
130      135      140

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Ala Ala Asp Ala Ala Pro Gly Ala Ala Ala Glu Gly Ser Pro Ser Pro  
145 150 155 160

Ala Ser Ser Trp Ser Gly Gly Ala Ser Pro Ala Pro Ser Ala Ser Pro  
165 170 175

Tyr Ala Cys Thr Leu Ser Pro Gly Ser Pro Ala Gly Ser Ala Ser Asp  
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Pro His Arg Cys Leu  
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Arg Glu Arg Arg Arg Met Gln Gly Leu Asn Thr Ala Phe Asp Arg Leu  
50 55 60

Arg Arg Val Val Pro Gln Trp Gly Gln Asp Lys Lys Leu Ser Lys Tyr  
65 70 75 80

Glu Thr Leu Gln Met Ala Leu Ser Tyr Ile Ile Ala Leu Thr Arg Ile

85

90

95

Leu Ala Glu Ala Glu Arg Asp Trp Val Gly Leu Arg Cys Glu Gln Arg  
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Gly Arg Asp His Pro Tyr Leu Pro Phe Pro Gly Ala Arg Leu Gln Val  
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Asp Pro Glu Pro Tyr Gly Gln Arg Leu Phe Gly Phe Gln Pro Glu Pro  
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Phe Pro Met Ala Ser  
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 35 40 45  
 Ala Glu Val Gly Asp Cys Arg Gly Thr Ser Arg Lys Leu Arg Ala Arg  
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 Arg Gly Gly Arg Asn Arg Pro Lys Ser Glu Leu Ala Leu Ser Lys Gln  
 65 70 75 80  
 Arg Arg Ser Arg Arg Lys Lys Ala Asn Asp Arg Glu Arg Asn Arg Met  
 85 90 95  
 His Asn Leu Asn Ser Ala Leu Asp Ala Leu Arg Gly Val Leu Pro Thr  
 100 105 110  
 Phe Pro Asp Asp Ala Lys Leu Thr Lys Ile Glu Thr Leu Arg Phe Ala  
 115 120 125  
 His Asn Tyr Ile Trp Ala Leu Thr Gln Thr Leu Arg Ile Ala Asp His  
 130 135 140  
 Ser Phe Tyr Gly Pro Glu Pro Pro Val Pro Cys Gly Glu Leu Gly Ser  
 145 150 155 160  
 Pro Gly Gly Gly Ser Asn Gly Asp Trp Gly Ser Ile Tyr Ser Pro Val  
 165 170 175  
 Ser Gln Ala Gly Asn Leu Ser Pro Thr Ala Ser Leu Glu Glu Phe Pro  
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| Met | Phe | Val | Lys | Ser | Glu | Thr | Leu | Glu | Leu | Lys | Glu | Glu | Glu | Glu | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Met | Leu | Leu | Gly | Ser | Ala | Ser | Pro | Ala | Ser | Ala | Thr | Leu | Thr | Pro |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Met | Ser | Ser | Ser | Ala | Asp | Glu | Glu | Glu | Asp | Glu | Glu | Leu | Arg | Arg | Pro |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Ser | Ala | Arg | Gly | Gln | Arg | Gly | Ala | Glu | Ala | Glu | Gln | Gly | Val | Gln |
|     |     |     | 50  |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gly | Ser | Pro | Ala | Ser | Gly | Ala | Gly | Gly | Cys | Arg | Pro | Gly | Arg | Leu | Leu |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |
| Gly | Leu | Met | His | Glu | Cys | Lys | Arg | Arg | Pro | Ser | Arg | Ser | Arg | Ala | Val |
|     |     |     | 85  |     |     |     |     | 90  |     |     |     |     |     | 95  |     |
| Ser | Arg | Gly | Ala | Lys | Thr | Ala | Glu | Thr | Val | Gln | Arg | Ile | Lys | Lys | Thr |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Arg | Leu | Lys | Ala | Asn | Asn | Arg | Glu | Arg | Asn | Arg | Met | His | Asn | Leu |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Asn | Ala | Ala | Leu | Asp | Ala | Leu | Arg | Glu | Val | Leu | Pro | Thr | Phe | Pro | Glu |
|     |     | 130 |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asp | Ala | Lys | Leu | Thr | Lys | Ile | Glu | Thr | Leu | Arg | Phe | Ala | His | Asn | Tyr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ile | Trp | Ala | Leu | Thr | Glu | Thr | Leu | Arg | Leu | Ala | Asp | His | Cys | Ala | Gly |
|     |     |     | 165 |     |     |     |     | 170 |     |     |     |     |     | 175 |     |
| Ala | Gly | Gly | Leu | Gln | Gly | Ala | Leu | Phe | Thr | Glu | Ala | Val | Leu | Leu | Ser |

|   |     |     |
|---|-----|-----|
| 180   | 185 | 190 |
| Pro Gly Ala Ala Leu Gly Ala Ser Gly Asp Ser Pro Ser Pro Pro Ser |     |     |
| 195   | 200 | 205 |
| Ser Trp Ser Cys Thr Asn Ser Pro Ala Ser Ser Ser Asn Ser Thr Ser |     |     |
| 210   | 215 | 220 |
| Pro Tyr Ser Cys Thr Leu Ser Pro Ala Ser Pro Gly Ser Asp Val Asp |     |     |
| 225   | 230 | 235 |
| Tyr Trp Gln Pro Pro Pro Pro Glu Lys His Arg Tyr Ala Pro His Leu |     |     |
| 245   | 250 | 255 |
| Pro Leu Ala Arg Asp Cys Ile                                     |     |     |
| 260   |     |     |

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|             |             |             |            |             |             |      |
|-------------|-------------|-------------|------------|-------------|-------------|------|
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| ggagatTTTT  | ttcacatttc  | tagtggctga  | gctaaactct | cagaaaattt  | aaaagaacct  | 1380 |
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<400> 33

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|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|--|
| Met | Ala | Lys | Met | Tyr | Met | Lys | Ser | Lys | Asp | Met | Val | Glu | Leu | Val | Asn |  |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |  |
| Thr | Gln | Ser | Trp | Met | Asp | Lys | Gly | Leu | Ser | Ser | Gln | Asn | Glu | Met | Lys |  |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |  |
| Glu | Gln | Glu | Arg | Arg | Pro | Gly | Ser | Tyr | Gly | Met | Leu | Gly | Thr | Leu | Thr |  |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |  |
| Glu | Glu | His | Asp | Ser | Ile | Glu | Glu | Asp | Glu | Glu | Glu | Glu | Glu | Asp | Gly |  |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |  |
| Asp | Lys | Pro | Lys | Arg | Arg | Gly | Pro | Lys | Lys | Lys | Lys | Met | Thr | Lys | Ala |  |
| 65  |     |     |     |     | 70  |     |     |     | 75  |     |     |     |     | 80  |     |  |
| Arg | Leu | Glu | Arg | Phe | Arg | Ala | Arg | Arg | Val | Lys | Ala | Asn | Ala | Arg | Glu |  |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |  |
| Arg | Thr | Arg | Met | His | Gly | Leu | Asn | Asp | Ala | Leu | Asp | Asn | Leu | Arg | Arg |  |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |  |
| Val | Met | Pro | Cys | Tyr | Ser | Lys | Thr | Gln | Lys | Leu | Ser | Lys | Ile | Glu | Thr |  |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |  |
| Leu | Arg | Leu | Ala | Arg | Asn | Tyr | Ile | Trp | Ala | Leu | Ser | Glu | Val | Leu | Glu |  |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |  |
| Thr | Gly | Gln | Thr | Leu | Glu | Gly | Lys | Gly | Phe | Val | Glu | Met | Leu | Cys | Lys |  |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |  |
| Gly | Leu | Ser | Gln | Pro | Thr | Ser | Asn | Leu | Val | Ala | Gly | Cys | Leu | Gln | Leu |  |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |  |

Gly Pro Gln Ser Thr Leu Leu Glu Lys His Glu Glu Lys Ser Ser Ile  
 180 185 190  
 Cys Asp Ser Thr Ile Ser Val His Ser Phe Asn Tyr Gln Ser Pro Gly  
 195 200 205  
 Leu Pro Ser Pro Pro Tyr Gly His Met Glu Thr His Ser Leu His Leu  
 210 215 220  
 Lys Pro Gln Pro Phe Lys Ser Leu Gly Asp Ser Phe Gly Ser His Pro  
 225 230 235 240  
 Pro Asp Cys Ser Thr Pro Pro Tyr Glu Gly Pro Leu Thr Pro Pro Leu  
 245 250 255  
 Ser Ile Ser Gly Asn Phe Ser Leu Lys Gln Asp Gly Ser Pro Asp Leu  
 260 265 270  
 Glu Lys Ser Tyr Asn Phe Met Pro His Tyr Thr Ser Ala Ser Leu Ser  
 275 280 285  
 Ser Gly His Val His Ser Thr Pro Phe Gln Thr Gly Thr Pro Arg Tyr  
 290 295 300  
 Asp Val Pro Val Asp Leu Ser Tyr Asp Ser Tyr Ser His His Ser Ile  
 305 310 315 320  
 Gly Thr Gln Leu Asn Thr Ile Phe Ser Asp  
 325 330

<210> 34  
 <211> 800  
 <212> DNA  
 <213> MOUSE

<400> 34  
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 agttttctga cccccctcct gttttgcctg ctctaccctg ccttgtagct ttctaatac 180  
 aagtcttttc agttccotta gttttcaccc atcaacttca gcagcccaca ccctctagtt 240  
 ccttcctggg ttaaacaaaa acaaacacgc agtggcaaag ctggacctgg tcagagaagc 300  
 cttgtgaagg aggtgtgtct ttaggctagg aaggggagg gctaccctgt gggcaacatc 360  
 tccgcacctg gtcagcagcc aaaaccagca aaacggcggc aagtcagaag ctccagtcag 420  
 atcacaggag ctgcccagag actgtggtac tgaaagaact actcgcgga gctgaccccg 480  
 ggaaagaggt actgaaaaga catagaaaac cagctgtggt ggaggcactg acatgaaggc 540  
 atcctggtag tgcatcagaa ctccaggaaa aagtagaata agtaacagcc aaggtactca 600  
 gaccaggaac agtcactaga aggtagctac cagttaaca tggacgactg aaaggggtctt 660  
 ctgtttccca cgatctgcct gggtcagggtca gggtagaact gactgctctg atagttcttc 720

aggacacaga ttagagttta atcttggaac tggacttcca gaggtgagcc tgtgaacggg 780  
gtgtgggtac taaagtttct 800

<210> 35  
<211> 515  
<212> DNA  
<213> CHICKEN

<400> 35  
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agtgcagcac agaaagaatg gagagcgctg ccaagagaag actggctgcc aacgccaggg 180  
agagaagacg gatgcaagga ctgaacacag cctttgatcg tttgaggaag gtggttccac 240  
agtggggtca agataagaag ctctccaaat atgagaccct tcagatggct ttgagttata 300  
tcatggctct aacacgaata cttgctgaag cagagagata cagtactgaa agagaatgga 360  
ttaaccttca ctgtgaacac tttcatccag agagctacca ccattatacg ggacaaaaag 420  
tggcaacaga cagtgatcct tatgcacagc gaatattcag ctatcacct gaacactttc 480  
aaatagctaa ttagaactta ttacgagcta aaaaa 515

<210> 36  
<211> 151  
<212> PRT  
<213> CHICKEN

<400> 36

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Met | Lys | Thr | Cys | Gln | Ser | Ser | His | Leu | Asp | Ser | Gly | Val | Glu | Ser | Asp | 1   | 5   | 10  | 15 |
| Ile | Gln | Cys | Arg | Ser | Gly | Ser | Gly | Cys | Val | Val | Lys | Cys | Ser | Thr | Glu | 20  | 25  | 30  |    |
| Arg | Met | Glu | Ser | Ala | Ala | Lys | Arg | Arg | Leu | Ala | Ala | Asn | Ala | Arg | Glu | 35  | 40  | 45  |    |
| Arg | Arg | Arg | Met | Gln | Gly | Leu | Asn | Thr | Ala | Phe | Asp | Arg | Leu | Arg | Lys | 50  | 55  | 60  |    |
| Val | Val | Pro | Gln | Trp | Gly | Gln | Asp | Lys | Lys | Leu | Ser | Lys | Tyr | Glu | Thr | 65  | 70  | 75  | 80 |
| Leu | Gln | Met | Ala | Leu | Ser | Tyr | Ile | Met | Ala | Leu | Thr | Arg | Ile | Leu | Ala | 85  | 90  | 95  |    |
| Glu | Ala | Glu | Arg | Tyr | Ser | Thr | Glu | Arg | Glu | Trp | Ile | Asn | Leu | His | Cys | 100 | 105 | 110 |    |
| Glu | His | Phe | His | Pro | Glu | Ser | Tyr | His | His | Tyr | Thr | Gly | Gln | Lys | Val | 115 | 120 | 125 |    |

Ala Thr Asp Ser Asp Pro Tyr Ala Gln Arg Ile Phe Ser Tyr His Pro  
 130 135 140

Glu His Phe Gln Ile Ala Asn  
 145 150

<210> 37  
 <211> 1412  
 <212> DNA  
 <213> MOUSE

<400> 37  
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 gaagaggagg tactgatgct gctgggctcg gcttcccccg cctcggcgac cctgacccccg 180  
 atgtcctcca gcgcggacga ggaggaggac gaggagctgc gccggccggg ctccgcgcgt 240  
 gggcagcgtg gagcggaagc cgggcagggg gtgcagggca gtccggcgtc gggtgccggg 300  
 ggttgccggc cagggcggct gctgggcctg atgcacgagt gcaagcgctc cccgtcgcgc 360  
 tcacggggccg tctcccgagg tgccaagacg gcggagacgg tgcagcgcac caagaagacc 420  
 cgcaggctca aggccaaaca ccgcgagcgc aaccgcatgc acaacctaaa cgccgcgctg 480  
 gacgcgctgc gcgaggtgct gcccaccttc cccgaggatg ccaagctcac gaagatcgag 540  
 acgctgcgct tcgcccacaa ttacatctgg gcgctcaccg agactctgcg cctggcggac 600  
 cactgcgccg gcgcgggtgg cctccagggg gcgctcttca cggaggcggt gctcctgagc 660  
 ccgggagctg cgctcggcgc cagcggggac agcccttctc caccttcctc ctggagctgc 720  
 accaacagcc cggcgctcgc ctccaactcc acgtcccat acagctgcac tttatcgccc 780  
 gctagccccg ggtcagacgt ggactactgg cagccccac ctccggagaa gcacgcttat 840  
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 agaactccgg gcaggcagtt cgtgtgaatc tctcagaggg aatgcaactg gtccctgtga 1260  
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<210> 38  
<211> 263  
<212> PRT  
<213> MOUSE

<400> 38

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Phe | Val | Lys | Ser | Glu | Thr | Leu | Glu | Leu | Lys | Glu | Glu | Glu | Glu | Val |
| 1   |     |     |     | 5   |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Met | Leu | Leu | Gly | Ser | Ala | Ser | Pro | Ala | Ser | Ala | Thr | Leu | Thr | Pro |
|     |     |     | 20  |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Met | Ser | Ser | Ser | Ala | Asp | Glu | Glu | Glu | Asp | Glu | Glu | Leu | Arg | Arg | Pro |
|     |     |     | 35  |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Gly | Ser | Ala | Arg | Gly | Gln | Arg | Gly | Ala | Glu | Ala | Gly | Gln | Gly | Val | Gln |
|     |     |     | 50  |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Gly | Ser | Pro | Ala | Ser | Gly | Ala | Gly | Gly | Cys | Arg | Pro | Gly | Arg | Leu | Leu |
| 65  |     |     |     |     | 70  |     |     |     |     | 75  |     |     |     |     | 80  |
| Gly | Leu | Met | His | Glu | Cys | Lys | Arg | Arg | Pro | Ser | Arg | Ser | Arg | Ala | Val |
|     |     |     |     | 85  |     |     |     |     | 90  |     |     |     |     | 95  |     |
| Ser | Arg | Gly | Ala | Lys | Thr | Ala | Glu | Thr | Val | Gln | Arg | Ile | Lys | Lys | Thr |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Arg | Leu | Lys | Ala | Asn | Asn | Arg | Glu | Arg | Asn | Arg | Met | His | Asn | Leu |
|     |     |     | 115 |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| Asn | Ala | Ala | Leu | Asp | Ala | Leu | Arg | Glu | Val | Leu | Pro | Thr | Phe | Pro | Glu |
|     |     |     | 130 |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Asp | Ala | Lys | Leu | Thr | Lys | Ile | Glu | Thr | Leu | Arg | Phe | Ala | His | Asn | Tyr |
| 145 |     |     |     |     | 150 |     |     |     |     | 155 |     |     |     |     | 160 |
| Ile | Trp | Ala | Leu | Thr | Glu | Thr | Leu | Arg | Leu | Ala | Asp | His | Cys | Ala | Gly |
|     |     |     |     | 165 |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Ala | Gly | Gly | Leu | Gln | Gly | Ala | Leu | Phe | Thr | Glu | Ala | Val | Leu | Leu | Ser |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Pro | Gly | Ala | Ala | Leu | Gly | Ala | Ser | Gly | Asp | Ser | Pro | Ser | Pro | Pro | Ser |
|     |     |     | 195 |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Trp | Ser | Cys | Thr | Asn | Ser | Pro | Ala | Ser | Ser | Ser | Asn | Ser | Thr | Ser |
|     | 210 |     |     |     |     | 215 |     |     |     |     |     | 220 |     |     |     |
| Pro | Tyr | Ser | Cys | Thr | Leu | Ser | Pro | Ala | Ser | Pro | Gly | Ser | Asp | Val | Asp |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Tyr | Trp | Gln | Pro | Pro | Pro | Pro | Glu | Lys | His | Arg | Tyr | Ala | Pro | His | Leu |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Pro | Leu | Ala | Arg | Asp | Cys | Ile |     |     |     |     |     |     |     |     |     |
|     |     |     |     | 260 |     |     |     |     |     |     |     |     |     |     |     |

<210> 39  
<211> 938  
<212> DNA

<213> ZEBRA FISH

<400> 39

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gcttggggcg gggggagcag agcaagtacc caccagcctt ggcactcatg gccagcagtg      240
accacgcgc ctggctggct cccgtgcagg ctggcacctg cgcggcacac gccgaatacc      300
tgctgcactc gcccggtctg agcgcggaag gcgtgtcctc tgcctccaac ttcaggaaga      360
gcagcaagag tcctgtcaaa gtacgcgagc tctgccggct taaaggagct gtggggggcag      420
atgagggcag acagcggggc ccatccagca aatccaccaa cgtcgtgcag aaacagaggc      480
gaatggctgc caatgcccg gagaggcgaa gaatgcacgg attgaaccac gcgttcgacg      540
agctgcgcag tgtcatccca gcctttgaca acgacaagaa actctccaag tacgaaaccc      600
tgcagatggc ccagatctac atcaacgccc tgtccgactt actacagggc cccggtgcta      660
aagccgaccc gccaaactgc gacctgctgc atgccaacgt gttagaaacg gaccgatctc      720
ccagaggatc accgggcgtc tgtcggagag gcacgggcgt gggttaccg taccagtacg      780
aggacggaac attcaactct ttcattggagc aagacctcca gtcgccctct ggaacgagca      840
agtctggttc ggaggccagt aaagactcgc ctcggtcgaa ccggagtgat ggagaagttc      900
tcgcctcact gaagtgcgag tgagacctgc ccgggcgg      938
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<210> 40

<211> 266

<212> PRT

<213> ZEBRA FISH

<400> 40

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Met Asp Gly Met Ser Thr Asp Thr Arg Glu Val Val Glu Leu Asp Val
1          5          10         15
Gln His Ser Ser Leu Gly Arg Gly Glu Gln Ser Lys Tyr Pro Pro Ala
20        25        30
Leu Ala Leu Met Ala Ser Ser Asp Pro Arg Ala Trp Leu Ala Pro Val
35        40        45
Gln Ala Gly Thr Cys Ala Ala His Ala Glu Tyr Leu Leu His Ser Pro
50        55        60
Gly Ser Ser Ala Glu Gly Val Ser Ser Ala Ser Asn Phe Arg Lys Ser
65        70        75        80
Ser Lys Ser Pro Val Lys Val Arg Glu Leu Cys Arg Leu Lys Gly Ala
85        90        95
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Val Gly Ala Asp Glu Gly Arg Gln Arg Ala Pro Ser Ser Lys Ser Thr  
 100 105 110  
 Asn Val Val Gln Lys Gln Arg Arg Met Ala Ala Asn Ala Arg Glu Arg  
 115 120 125  
 Arg Arg Met His Gly Leu Asn His Ala Phe Asp Glu Leu Arg Ser Val  
 130 135 140  
 Ile Pro Ala Phe Asp Asn Asp Lys Lys Leu Ser Lys Tyr Glu Thr Leu  
 145 150 155 160  
 Gln Met Ala Gln Ile Tyr Ile Asn Ala Leu Ser Asp Leu Leu Gln Gly  
 165 170 175  
 Pro Gly Ala Lys Ala Asp Pro Pro Asn Cys Asp Leu Leu His Ala Asn  
 180 185 190  
 Val Leu Glu Thr Asp Arg Ser Pro Arg Gly Ser Pro Gly Val Cys Arg  
 195 200 205  
 Arg Gly Thr Gly Val Gly Tyr Pro Tyr Gln Tyr Glu Asp Gly Thr Phe  
 210 215 220  
 Asn Ser Phe Met Glu Gln Asp Leu Gln Ser Pro Ser Gly Thr Ser Lys  
 225 230 235 240  
 Ser Gly Ser Glu Ala Ser Lys Asp Ser Pro Arg Ser Asn Arg Ser Asp  
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 Gly Glu Val Leu Ala Ser Leu Lys Cys Glu  
 260 265

<210> 41  
 <211> 948  
 <212> DNA  
 <213> FROG

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 ggcagcattg atggagaaga ggatgatgaa gaagaagagg atggagagaa accaaaaaag 180  
 aggggaccca aaaaaaagaa gatgaccaag gctagagtgg agagggttccg tgtccgtaga 240  
 gtaaaagcca atgccaggga gcgttcaaga atgcatggac ttaatgatgc cctggaaaat 300  
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 agactggcca gaaactatat atgggcatta tctgatattc tagaacaagg tcaaaatgca 420  
 gagggaaagg gctttctgga aatactctgc aaaggctctt ctcagccaac aagcaactta 480  
 gtagctggct gcttgcaact tggacctcag gccatgttct tggataaaca cgaagaaaag 540  
 tctcatatat gtgattcctc tcttactggg catacttata attaccagtc cccaggacta 600  
 cccagtcctc cttatggtaa cattgatgtt caccacttgc acttgaaacc ctcttctttc 660



|            |             |            |              |             |            |     |
|------------|-------------|------------|--------------|-------------|------------|-----|
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| gaaggagctc | taacacctcc  | actcagcatc | ggtggtaatt   | tttctttgaa  | gcaagatagt | 780 |
| tcacccgata | tggataaaatc | atatgcattc | agggtccccct  | atccagctct  | tgggcttggt | 840 |
| ggatctcatg | gacatgcgtc  | acactttcat | accagtgttc   | caaggatatga | actacccata | 900 |
| gacatggctt | acgagcctta  | cccacaccat | gctatatattca | ctgaataa    |            | 948 |

<400> 42

Ser Gln Asp Glu Met Lys Glu Arg Asn Gln Ser Ala Tyr Asp Ile Ile  
20 25 30

Asp Glu Glu Glu Glu Asp Gly Glu Lys Pro Lys Lys Arg Gly Pro Lys  
50 55 60

Val Lys Ala Asn Ala Arg Glu Arg Ser Arg Met His Gly Leu Asn Asp  
85 90 95

Lys Leu Ser Lys Ile Glu Thr Leu Arg Leu Ala Arg Asn Tyr Ile Trp  
115 120 125

Phe Leu Glu Ile Leu Cys Lys Gly Leu Ser Gln Pro Thr Ser Asn Leu  
145 150 155 160

His Glu Glu Lys Ser His Ile Cys Asp Ser Ser Leu Thr Gly His Thr  
180 185 190

Asp Val His His Leu His Leu Lys Pro Ser Ser Phe Lys Pro Val Met  
210 215 220

|                         |                     |                         |         |     |  |     |
|-------------------------|---------------------|-------------------------|---------|-----|--|-----|
| 225                     |                     | 230                     |         | 235 |  | 240 |
| Glu Gly Ala Leu Thr     | Pro Pro Leu Ser     | Ile Gly Gly Asn Phe     | Ser Leu |     |  |     |
|                         | 245                 | 250                     | 255     |     |  |     |
| Lys Gln Asp Ser Ser     | Pro Asp Met Asp     | Lys Ser Tyr Ala Phe     | Arg Ser |     |  |     |
|                         | 260                 | 265                     | 270     |     |  |     |
| Pro Tyr Pro Ala Leu Gly | Leu Gly Gly Ser His | Gly His Ala Ser His     |         |     |  |     |
|                         | 275                 | 280                     | 285     |     |  |     |
| Phe His Thr Ser Val     | Pro Arg Tyr Glu Leu | Pro Ile Asp Met Ala Tyr |         |     |  |     |
|                         | 290                 | 295                     | 300     |     |  |     |
| Glu Pro Tyr Pro His     | His Ala Ile Phe Thr | Glu                     |         |     |  |     |
| 305                     | 310                 | 315                     |         |     |  |     |

<210> 43  
 <211> 1550  
 <212> DNA  
 <213> MOUSE

<400> 43  
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 caatgtgagg accagaaaca aattaagaaa ccagagagct ttccaaaaca agttgtcctt 180  
 cgaggaaaga gcattaaaag ggcccctgga gaagaaaccg agaaagaaga ggaggaagaa 240  
 gacagagagg aagaagatga gaatggcttg tccagaagga gggggctcag gaaaaaaaaa 300  
 accaccaaac tacgactgga aagggtcaag ttcaggagac aggaagctaa tgcgcgcgag 360  
 aggaaccgga tgcacggcct caatgatgct ctggacaatt tgcgaaaagt ggtcccctgt 420  
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 tgggcacttt ctgaaattct gaggattggc aagagaccgg atctgctcac gttcgtccaa 540  
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 tatgaaagta cctcccctga gtgtgccagc cctcagtttg aaggtccctt aagtcctccc 840  
 ccaattaact ataatgggat attttccctg aagcaagaag aaaccttgga ctatggcaaa 900  
 aattacaatt atggcatgca ttactgtgca gtgccacca ggggtcccct tgggcagggt 960  
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 gaccattttc tatgtcataa taaatccctt ttcgtatgag aacttccttt ccttccctct 1260  
 tgtctgtatc acactgtgat tctctctctc tctctctctc tctctctctc tctctctctc 1320  
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 tttcagttgt acagttatga tgaaaatgca tgttataaaa atcagatgag taaaatgtgt 1500  
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<210> 44  
 <211> 337  
 <212> PRT  
 <213> MOUSE

<400> 44

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Leu | Thr | Leu | Pro | Phe | Asp | Glu | Ser | Val | Val | Met | Pro | Glu | Ser | Gln | 1   | 5   | 10  | 15  |
| Met | Cys | Arg | Lys | Phe | Ala | Arg | Gln | Cys | Glu | Asp | Gln | Lys | Gln | Ile | Lys | 20  | 25  | 30  |     |
| Lys | Pro | Glu | Ser | Phe | Pro | Lys | Gln | Val | Val | Leu | Arg | Gly | Lys | Ser | Ile | 35  | 40  | 45  |     |
| Lys | Arg | Ala | Pro | Gly | Glu | Glu | Thr | Glu | Lys | Glu | Glu | Glu | Glu | Glu | Asp | 50  | 55  | 60  |     |
| Arg | Glu | Glu | Glu | Asp | Glu | Asn | Gly | Leu | Ser | Arg | Arg | Arg | Gly | Leu | Arg | 65  | 70  | 75  | 80  |
| Lys | Lys | Lys | Thr | Thr | Lys | Leu | Arg | Leu | Glu | Arg | Val | Lys | Phe | Arg | Arg | 85  | 90  | 95  |     |
| Gln | Glu | Ala | Asn | Ala | Arg | Glu | Arg | Asn | Arg | Met | His | Gly | Leu | Asn | Asp | 100 | 105 | 110 |     |
| Ala | Leu | Asp | Asn | Leu | Arg | Lys | Val | Val | Pro | Cys | Tyr | Ser | Lys | Thr | Gln | 115 | 120 | 125 |     |
| Lys | Leu | Ser | Lys | Ile | Glu | Thr | Leu | Arg | Leu | Ala | Lys | Asn | Tyr | Ile | Trp | 130 | 135 | 140 |     |
| Ala | Leu | Ser | Glu | Ile | Leu | Arg | Ile | Gly | Lys | Arg | Pro | Asp | Leu | Leu | Thr | 145 | 150 | 155 | 160 |
| Phe | Val | Gln | Asn | Leu | Cys | Lys | Gly | Leu | Ser | Gln | Pro | Thr | Thr | Asn | Leu | 165 | 170 | 175 |     |
| Val | Ala | Gly | Cys | Leu | Gln | Leu | Asn | Ala | Arg | Ser | Phe | Leu | Met | Gly | Gln | 180 | 185 | 190 |     |
| Gly | Gly | Glu | Ala | Ala | His | His | Thr | Arg | Ser | Pro | Tyr | Ser | Thr | Phe | Tyr | 195 | 200 | 205 |     |

Pro Pro Tyr His Ser Pro Glu Leu Ala Thr Pro Pro Gly His Gly Thr  
 210 215 220  
 Leu Asp Asn Ser Lys Ser Met Lys Pro Tyr Asn Tyr Cys Ser Ala Tyr  
 225 230 235 240  
 Glu Ser Phe Tyr Glu Ser Thr Ser Pro Glu Cys Ala Ser Pro Gln Phe  
 245 250 255  
 Glu Gly Pro Leu Ser Pro Pro Pro Ile Asn Tyr Asn Gly Ile Phe Ser  
 260 265 270  
 Leu Lys Gln Glu Glu Thr Leu Asp Tyr Gly Lys Asn Tyr Asn Tyr Gly  
 275 280 285  
 Met His Tyr Cys Ala Val Pro Pro Arg Gly Pro Leu Gly Gln Gly Ala  
 290 295 300  
 Met Phe Arg Leu Pro Thr Asp Ser His Phe Pro Tyr Asp Leu His Leu  
 305 310 315 320  
 Arg Ser Gln Ser Leu Thr Met Gln Asp Glu Leu Asn Ala Val Phe His  
 325 330 335

Asn

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 <211> 1393  
 <212> DNA  
 <213> MOUSE

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 ggggcttatt cccttcggtt aactgggttg ccagcacctc ctctaacacg gcacctccga 180  
 gccattgcag tgcgatgtcc cgcctgctgc atgcagaaga gtgggctgag gtaaaagagt 240  
 tgggggacca ccacgccat cccagccgc accacgtccc gccgctgacg ccacagccac 300  
 ctgctaccct gcaggcgaga gaccttcccg tctaccggc agaactgtcc ctctggata 360  
 gcaccgaccc acgcgccttg ctgactccca ctttgcaggg cctctgcacg gcacgcgccg 420  
 ccagtatct gctgcattct cccgagctgg gtgcctccga ggccgcggcg ccccgggacg 480  
 aggctgacag ccagggtgag ctggtaagga gaagcggctg tggcggcctc agcaagagcc 540  
 ccgggcccgt caaagtacgg gaacagctgt gcaagctgaa ggggtggggt gtagtggacg 600  
 agcttggctg cagccgccag cgagcccctt ccagcaaaca ggtgaatggg gtacagaagc 660  
 aaaggaggct ggcagcaaac gcaagggaac ggcgcaggat gcacgggctg aaccacgcct 720  
 tcgaccagct gcgcaacggt atcccgtcct tcaacaacga caagaagctg tccaaatatg 780  
 agaccctaca gatggcccag atctacatca acgctctgtc ggagttgctg cagactccca 840

atgtcggaga gcaaccgccg ccgcccacag cttcctgcaa aaatgaccac catcaccttc 900  
 gcaccgcctc ctcctatgaa ggaggtgcgg gcgcctctgc ggtagctggg gctcagccag 960  
 ccccgaggagg gggcccgaga cctaccccg cggggccttg ccggactcgc ttctcaggcc 1020  
 cagcttcctc tgggggttac tgggtgcagc tggacgcttt gcacttccca gccttcgagg 1080  
 acagggccct aacagcgatg atggcacaga aggacctgtc gccttcgctg cccgggggca 1140  
 tcctgcagcc tgtacaggag gacaacagca aaacatctcc cagatccac agaagtgacg 1200  
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 cggacggctg cag 1393

<210> 46  
 <211> 351  
 <212> PRT  
 <213> MOUSE

<400> 46

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 Gly Asp His His Arg His Pro Gln Pro His His Val Pro Pro Leu Thr  
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 35 40 45  
 Ala Glu Leu Ser Leu Leu Asp Ser Thr Asp Pro Arg Ala Trp Leu Thr  
 50 55 60  
 Pro Thr Leu Gln Gly Leu Cys Thr Ala Arg Ala Ala Gln Tyr Leu Leu  
 65 70 75 80  
 His Ser Pro Glu Leu Gly Ala Ser Glu Ala Ala Ala Pro Arg Asp Glu  
 85 90 95  
 Ala Asp Ser Gln Gly Glu Leu Val Arg Arg Ser Gly Cys Gly Gly Leu  
 100 105 110  
 Ser Lys Ser Pro Gly Pro Val Lys Val Arg Glu Gln Leu Cys Lys Leu  
 115 120 125  
 Lys Gly Gly Val Val Val Asp Glu Leu Gly Cys Ser Arg Gln Arg Ala  
 130 135 140  
 Pro Ser Ser Lys Gln Val Asn Gly Val Gln Lys Gln Arg Arg Leu Ala  
 145 150 155 160  
 Ala Asn Ala Arg Glu Arg Arg Arg Met His Gly Leu Asn His Ala Phe  
 165 170 175

Asp Gln Leu Arg Asn Val Ile Pro Ser Phe Asn Asn Asp Lys Lys Leu  
 180 185 190  
 Ser Lys Tyr Glu Thr Leu Gln Met Ala Gln Ile Tyr Ile Asn Ala Leu  
 195 200 205  
 Ser Glu Leu Leu Gln Thr Pro Asn Val Gly Glu Gln Pro Pro Pro Pro  
 210 215 220  
 Thr Ala Ser Cys Lys Asn Asp His His His Leu Arg Thr Ala Ser Ser  
 225 230 235 240  
 Tyr Glu Gly Gly Ala Gly Ala Ser Ala Val Ala Gly Ala Gln Pro Ala  
 245 250 255  
 Pro Gly Gly Gly Pro Arg Pro Thr Pro Pro Gly Pro Cys Arg Thr Arg  
 260 265 270  
 Phe Ser Gly Pro Ala Ser Ser Gly Gly Tyr Ser Val Gln Leu Asp Ala  
 275 280 285  
 Leu His Phe Pro Ala Phe Glu Asp Arg Ala Leu Thr Ala Met Met Ala  
 290 295 300  
 Gln Lys Asp Leu Ser Pro Ser Leu Pro Gly Gly Ile Leu Gln Pro Val  
 305 310 315 320  
 Gln Glu Asp Asn Ser Lys Thr Ser Pro Arg Ser His Arg Ser Asp Gly  
 325 330 335  
 Glu Phe Ser Pro His Ser His Tyr Ser Asp Ser Asp Glu Ala Ser  
 340 345 350

<210> 47  
 <211> 993  
 <212> DNA  
 <213> MOUSE

<400> 47  
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 tatggaatgc tcggaacctt aactgaagag catgacagta ttgaggagga tgaagaagag 180  
 gaagaagatg gagataaacc taaaagaaga ggtcccaaga aaaagaagat gactaaagct 240  
 cgccttgaaa gattcagggc tcgaagagtc aaggccaatg ctagagaacg gaccoggatg 300  
 catggcctga atgatgcctt ggataatctt aggagagtca tgccatgtta ctctaaaact 360  
 caaaagcttt ccaagataga gactcttcga ctggcaagga actacatctg ggccttgtct 420  
 gaagtcctgg agactggtca gacacttgaa gggaagggat ttgtagagat gctatgtaaa 480  
 ggtctctctc aaccacaaag caacctggtt gctggatgcc tccaactggg gcctcaatct 540  
 accctcctgg agaagcatga ggaaaaatct tcaatttgtg actctactat ctctgtccac 600  
 agcttcaact atcagtctcc agggctcccc agcctcctt atggccatat ggaaacacat 660

tctctccatc tcaagcctca accattttaag agtttgggtg actcttttgg gagccatcca 720  
cctgactgca gtaccccccc ttatgagggt ccactcacac caccctgag cattagtggc 780  
aacttctcct taaagcaaga cggtccct gatttggaaa aatcctacaa tttcatgcca 840  
cattatacct ctgcaagtct aagttcagg catgtgcatt caactccctt tcagactggc 900  
actccccgct atgatgttcc tgtagacctg agctatgatt cctactccca ccatagcatt 960  
ggaactcagc tcaatacgat cttctctgat tag 993

<210> 48  
<211> 330  
<212> PRT  
<213> MOUSE

<400> 48

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |    |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|
| Met | Ala | Lys | Met | Tyr | Met | Lys | Ser | Lys | Asp | Met | Val | Glu | Leu | Val | Asn | 1   | 5   | 10  | 15 |
| Thr | Gln | Ser | Trp | Met | Asp | Lys | Gly | Leu | Ser | Ser | Gln | Asn | Glu | Met | Lys | 20  | 25  | 30  |    |
| Glu | Gln | Glu | Arg | Arg | Pro | Gly | Ser | Tyr | Gly | Met | Leu | Gly | Thr | Leu | Thr | 35  | 40  | 45  |    |
| Glu | Glu | His | Asp | Ser | Ile | Glu | Glu | Asp | Glu | Glu | Glu | Glu | Glu | Asp | Gly | 50  | 55  | 60  |    |
| Asp | Lys | Pro | Lys | Arg | Arg | Gly | Pro | Lys | Lys | Lys | Lys | Met | Thr | Lys | Ala | 65  | 70  | 75  |    |
| Arg | Leu | Glu | Arg | Phe | Arg | Ala | Arg | Arg | Val | Lys | Ala | Asn | Ala | Arg | Glu | 85  | 90  | 95  |    |
| Arg | Thr | Arg | Met | His | Gly | Leu | Asn | Asp | Ala | Leu | Asp | Asn | Leu | Arg | Arg | 100 | 105 | 110 |    |
| Val | Met | Pro | Cys | Tyr | Ser | Lys | Thr | Gln | Lys | Leu | Ser | Lys | Ile | Glu | Thr | 115 | 120 | 125 |    |
| Leu | Arg | Leu | Ala | Arg | Asn | Tyr | Ile | Trp | Ala | Leu | Ser | Glu | Val | Leu | Glu | 130 | 135 | 140 |    |
| Thr | Gly | Gln | Thr | Leu | Glu | Gly | Lys | Gly | Phe | Val | Glu | Met | Leu | Cys | Lys | 145 | 150 | 155 |    |
| Gly | Leu | Ser | Gln | Pro | Thr | Ser | Asn | Leu | Val | Ala | Gly | Cys | Leu | Gln | Leu | 165 | 170 | 175 |    |
| Gly | Pro | Gln | Ser | Thr | Leu | Leu | Glu | Lys | His | Glu | Glu | Lys | Ser | Ser | Ile | 180 | 185 | 190 |    |
| Cys | Asp | Ser | Thr | Ile | Ser | Val | His | Ser | Phe | Asn | Tyr | Gln | Ser | Pro | Gly | 195 | 200 | 205 |    |
| Leu | Pro | Ser | Pro | Pro | Tyr | Gly | His | Met | Glu | Thr | His | Ser | Leu | His | Leu | 210 | 215 | 220 |    |

Lys Pro Gln Pro Phe Lys Ser Leu Gly Asp Ser Phe Gly Ser His Pro  
 225 230 235 240  
 Pro Asp Cys Ser Thr Pro Pro Tyr Glu Gly Pro Leu Thr Pro Pro Leu  
 245 250 255  
 Ser Ile Ser Gly Asn Phe Ser Leu Lys Gln Asp Gly Ser Pro Asp Leu  
 260 265 270  
 Glu Lys Ser Tyr Asn Phe Met Pro His Tyr Thr Ser Ala Ser Leu Ser  
 275 280 285  
 Ser Gly His Val His Ser Thr Pro Phe Gln Thr Gly Thr Pro Arg Tyr  
 290 295 300  
 Asp Val Pro Val Asp Leu Ser Tyr Asp Ser Tyr Ser His His Ser Ile  
 305 310 315 320  
 Gly Thr Gln Leu Asn Thr Ile Phe Ser Asp  
 325 330

<210> 49  
 <211> 2264  
 <212> DNA  
 <213> FROG

<400> 49  
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 cctgtcttgt agctggagag ctttgtatcg atgctaagag cactgggtat ctacaaagag 120  
 gatcactgca tatgaatgga ataaggagtg ctgctgctac ccaggctggg gtttgttccg 180  
 agcccttcaa aaccttttgg ccatagaatc actgtgttga catgaagtca gattcaccag 240  
 tgcattggga gtccatact gaatgccagt caccatgccc actaagttgc atgccagcca 300  
 ggctggaagg ctctaccaag agacgtctgg ctgccaatgc cagggaaaga aggagaatgc 360  
 aaggactgaa taccgccttc gatagtctga ggaaagttgt accgcaatgg ggtgaggaca 420  
 aaaaactttc caagtatgag actctacaga tggcactgag ctacatcatg gactaagca 480  
 ggatcctcac ggaagcagaa agatacagca gaactgatcc aggggaatgg actaaaatgc 540  
 actttgatca cattcaggaa gaacagtgcc tcagttatat gggagtgaga tgcccaagag 600  
 actgtgatcg ctacctgccc cagacttttt ctactagga taggagatgt gagcaacagt 660  
 cagcaggcaa ggtactatag acctgaagat agcagtgtat tcctacacac agcagccaat 720  
 aatacaggga catttgcac atgggttatt tgtcatgtca ttctgccaa tgcactgctt 780  
 atttcattaa gcacccaaag tcccaggact gggaatatat gtagggcacc ccacgtgatg 840  
 cagcccaaag tatgtgctgc tgcaactgat agtgagctgt gggacactgg aaaagcaaag 900  
 tgcgctggta ttttgtaa atgaaatgtca ttatgggtgg catataataa ttacttacac 960  
 acagcacagt tatataattt cattgctgtt agaaagcccc tttgtctctt accccccatc 1020



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ttcagttggt aagtgtctggt aaacagcagc tgcccacaag ttctgtgcac tgctcatagg 1200
ggaaaggaaa catttttgcc acttgctaga gaatgctaatt tgcattgtac tctgtaatat 1260
tgtcttgtgt ccagggttaag aaaggtctaa attaaaatca ataggaggca taatttacac 1320
atttccttta agctgtaatt ttctggcttt tgtctgcatt ttaatagtgg aaaattacaa 1380
cgtgtataaa attcctactg gtctcattct acttgtttct gtaagacaaa ccctgggtgtg 1440
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ttttttttca atgggcatga gttgtttatt tgtaaacaca gctccaaagt taacagattg 1560
cttgatatctt tcagggtatgc aaatggtatt ttagtctatt ctgggacttt gaaatagaaa 1620
gcaatatgca accctttaga attagaaaat gtagtacaac ggaacaaatg gtgaatggct 1680
tggcagagta ctgtacatac tgacctatgg agcatagttg gctaaatcag tctgcagttc 1740
acttttactg gtgtgttgca gttagaataa taaaatcgga tgttgctaag gttgttacag 1800
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aatgtattgt tatctttcga aaaatgtgga tggaacgtga tcagggtgcaa attcatgcga 1920
ttacctgtg cataattcct ataaaacaga gacaatgtgt agttatagga ggattcacta 1980
cacggatgaa agatcttatt tacaacaggt taggcacaaa aagtcagga ccatgaaaaa 2040
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tcagcaccat attataatcc agcacaaggc agtaagtata aggctcccat actcttctca 2160
ctgataagct tgctagagat gttcccaagg aagcccatgt gctgcccatc ttctgccctt 2220
cctctaggca gcactgctc acatgcggaa tgaaggccca agcg 2264

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<210> 50
<211> 138
<212> PRT
<213> FROG

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<400> 50

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Met Lys Ser Asp Ser Pro Val His Gly Glu Ser His Thr Glu Cys Gln
1           5           10           15

```

```

Ser Pro Cys Pro Leu Ser Cys Met Pro Ala Arg Leu Glu Gly Ser Thr
20           25           30

```

```

Lys Arg Arg Leu Ala Ala Asn Ala Arg Glu Arg Arg Arg Met Gln Gly
35           40           45

```

```

Leu Asn Thr Ala Phe Asp Ser Leu Arg Lys Val Val Pro Gln Trp Gly

```

|   |     |         |
|---|-----|---------|
| 50  | 55  | 60      |
| Glu Asp Lys Lys Leu Ser Lys Tyr Glu Thr Leu Gln Met Ala Leu Ser |     |         |
| 65  | 70  | 75 80   |
| Tyr Ile Met Ala Leu Ser Arg Ile Leu Thr Glu Ala Glu Arg Tyr Ser |     |         |
|   | 85  | 90 95   |
| Arg Thr Asp Pro Gly Glu Trp Thr Lys Met His Phe Asp His Ile Gln |     |         |
|   | 100 | 105 110 |
| Glu Glu Gln Cys Leu Ser Tyr Met Gly Val Arg Cys Pro Arg Asp Cys |     |         |
|   | 115 | 120 125 |
| Asp Arg Tyr Leu Pro Gln Thr Phe Ser His                         |     |         |
|   | 130 | 135     |

<210> 51  
 <211> 2123  
 <212> DNA  
 <213> FROG

<400> 51  
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 taaaaatgaa ataaggagat actaccacagg ctgggggttta ttttgagtct ttcagaactt 180  
 tctagggata gaatatctct gctgacatga agtcagattc accagtgcac agggagtccc 240  
 atactggatg ccagtcacca tgcccactaa ggtgcttgcc agccaggctg gaaggctcta 300  
 ccaagagacg tctggctgcc aatgccagag aaaggaggag aatgcaagga ctaaataccg 360  
 ccttcgatag tctgaggaaa gttgtaccac aatgggggtga agacaaacaa ctttccaaat 420  
 atgagactct gcagatggcg ctgagctaca tcatggcact gagcaggatc ctctcggaag 480  
 cagagaggta cagcaggact gatccagagg aatggactaa tattcaatat gatcacattg 540  
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 tgccccagac tttttctcac taggataaga gcaggcaagg tactactgac ctgaagacag 660  
 cactgtttta atataatggg tcggttatac agcacccaat gatacaggga catttgcatc 720  
 atgggctatt tgtcatgttg tttttcccaa tgcaatgctt atttccttaa gcaccctacg 780  
 ttcaggactg ggtacatatg tagggaaccc caagtgatgc agcccagagg atgcggtgct 840  
 gcaacggatg gcagttagtg agctgtggaa cactggaaaa gccaaagtga ctgggtatatt 900  
 gtgaaaggac atgcaagtta ttatgggtgg catataatat ttacctccat acagcacagt 960  
 gatataactt cattgcctcc atcatacctg tgtgattata tataaaatgg tagttcctga 1020  
 gtcactactt tccatgttac ttatgcaactg ttatcagata acatagagaa agtagtattt 1080  
 atacattaga aaaagtacta tatgtgcata taaattggcg tttaaagcag tctggataaa 1140

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aggcactgct cataagggaa aggaaacatt tttgtcactt gctgataata caaattgcat 1260
tctacaccag aattcttaat taactatact gtctagttaa cagaaaggtc taaattaaaa 1320
tcaacaagag gtataattta catattttac cattttctgg cttctgtctg ctttttgaga 1380
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ccctatcaaa atcactgcag gtttattggt ttgttgcaga tagaataata aaatctgaca 1800
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cctaacgagg caacttcagc acg 2123

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<210> 52
<211> 138
<212> PRT
<213> FROG

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<400> 52

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Met Lys Ser Asp Ser Pro Val His Arg Glu Ser His Thr Gly Cys Gln
1          5          10          15

Ser Pro Cys Pro Leu Arg Cys Leu Pro Ala Arg Leu Glu Gly Ser Thr
          20          25          30

Lys Arg Arg Leu Ala Ala Asn Ala Arg Glu Arg Arg Arg Met Gln Gly
          35          40          45

Leu Asn Thr Ala Phe Asp Ser Leu Arg Lys Val Val Pro Gln Trp Gly
          50          55          60

Glu Asp Lys Gln Leu Ser Lys Tyr Glu Thr Leu Gln Met Ala Leu Ser
65          70          75          80

Tyr Ile Met Ala Leu Ser Arg Ile Leu Ser Glu Ala Glu Arg Tyr Ser
          85          90          95

Arg Thr Asp Pro Glu Glu Trp Thr Asn Ile Gln Tyr Asp His Ile Glu

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 Glu Glu Gln Cys Leu Ser Tyr Met Glu Val Arg Cys Pro Arg Asp Cys  
 115 120 125

Asp Arg Tyr Leu Pro Gln Thr Phe Ser His  
 130 135

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 <211> 136  
 <212> DNA  
 <213> BEETLE

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 agacaagtta taccaagctt ggacgctgac cacaaattga gcaagtttga gactctgcag 120  
 atggcccaga cctaca 136

<210> 54  
 <211> 45  
 <212> PRT  
 <213> BEETLE

<400> 54

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Phe Asp Arg Leu Arg Gln Val Ile Pro Ser Leu Asp Ala Asp His Lys  
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Leu Ser Lys Phe Glu Thr Leu Gln Met Ala Gln Thr Tyr  
 35 40 45

<210> 55  
 <211> 137  
 <212> DNA  
 <213> BEETLE

<400> 55  
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 cgggacgtgg tgccgtccct tgggaacgat cggaagctgt ccaagtttga gacacttcag 120  
 atggcccaga cctacat 137

<210> 56  
 <211> 45  
 <212> PRT  
 <213> BEETLE

<400> 56

Ala Ala Asn Ala Arg Glu Arg Arg Arg Met Asn Ser Leu Asn Asp Ala  
 1 5 10 15

Phe Asp Arg Leu Arg Asp Val Val Pro Ser Leu Gly Asn Asp Arg Lys

20

25

30

Leu Ser Lys Phe Glu Thr Leu Gln Met Ala Gln Thr Tyr  
 35 40 45

<210> 57  
 <211> 1572  
 <212> DNA  
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 <223> "n" can be any nucleotide

<220>  
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 <221> misc\_feature  
 <222> (1564)..(1564)  
 <223> "n" can be any nucleotide

<400> 57  
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 ggagaggagc ggggggagac tgagtggcgc gtgccgcttt ttaaaggggc gcagcgcctt 180  
 cagcaaccgg agaagcatag ttgcacgcga cctggtgtgt gatctccgag tgggtggggg 240  
 agggctcagg agggaaaaaa aaataagacg ttgcagaaga gacccgaaa gggccttttt 300  
 tttggttgag ctggtgtccc agtgctgcct ccgatcctga gcgtccgagc ctttgcagtg 360  
 caatgtcccg cctgctgcat gcagaagagt gggctgaagt gaaggagttg ggagaccacc 420  
 atcgccagcc ccagccgcat catctcccgc aaccgccgcc gccgccgag ccacctgcaa 480  
 ctttgaggc gagagagcat ccggtctacc cgctgagct gtccctcctg gacagcaccg 540  
 acccacgcgc ctggctggct cccactttgc agggcatctg cacggcacgc gccgccagt 600  
 atttgctaca ttccccggag ctgggtgcct cagaggccgc tgcgccccgg gacgaggtgg 660  
 acggccgggg ggagctggta aggaggagca gcggcggtgc cagcagcagc aagagccccg 720  
 ggccggtgaa agtgcgggaa cagctgtgca agctgaaagg cggggtggtg gtagacgagc 780

tgggctgcag cgcgaacgg gcccttcca gcaaacaggt gaatggggtg cagaagcaga 840  
 gacggctagc agccaacgcc agggagcggc gcaggatgca tgggctgaac cagccttcg 900  
 accagctgcg caatgttatc ccgtcgttca acaacgacaa gaagctgtcc aaatatgaga 960  
 ccctgcagat ggcccaaatac tacatcaacg ccttgtccga gctgctacaa acgcccagcg 1020  
 gaggggaaca gccaccgccc cctccagcct cctgcaaaag cgaccaccac caccttcgca 1080  
 ccgcggcctc ctatgaaggg ggcgcgggca acgcgaccgc agctggggct cagcaggctt 1140  
 ccggagggag ccagcggccc accccgcccg ggagttgccg gactcgcttc tcagccccag 1200  
 cttctgcggg agggctactc gtgcagctgg acgctctgca cttctcgact ttcgaggaca 1260  
 gcgccctgac agcgatgatg gcgcaaaaga atttgtctcc ttctctcccc gggagcatct 1320  
 tgcagccagt gcaggaggaa aacagcaaaa cttcgctcgc gtcccacaga agcgacgggg 1380  
 aattttcccc ccattcccat tacagtgact cggatgaggc aagttaggaa ggtgacagaa 1440  
 gcctgaaaac tgagacagaa acaaaactgc cttttcccag tgcgcgggaa gccccnggt 1500  
 taangatccc cgcacccttt aatttnggct ctgcgatggt cgttgtttag caacgacttg 1560  
 gctncagatg gt 1572

<210> 58  
 <211> 354  
 <212> PRT  
 <213> HUMAN

<400> 58

Met Ser Arg Leu Leu His Ala Glu Glu Trp Ala Glu Val Lys Glu Leu  
 1 5 10 15  
 Gly Asp His His Arg Gln Pro Gln Pro His His Leu Pro Gln Pro Pro  
 20 25 30  
 Pro Pro Pro Gln Pro Pro Ala Thr Leu Gln Ala Arg Glu His Pro Val  
 35 40 45  
 Tyr Pro Pro Glu Leu Ser Leu Leu Asp Ser Thr Asp Pro Arg Ala Trp  
 50 55 60  
 Leu Ala Pro Thr Leu Gln Gly Ile Cys Thr Ala Arg Ala Ala Gln Tyr  
 65 70 75 80  
 Leu Leu His Ser Pro Glu Leu Gly Ala Ser Glu Ala Ala Ala Pro Arg  
 85 90 95  
 Asp Glu Val Asp Gly Arg Gly Glu Leu Val Arg Arg Ser Ser Gly Gly  
 100 105 110  
 Ala Ser Ser Ser Lys Ser Pro Gly Pro Val Lys Val Arg Glu Gln Leu  
 115 120 125  
 Cys Lys Leu Lys Gly Gly Val Val Val Asp Glu Leu Gly Cys Ser Arg

| 130   | 135 | 140 |
|---|-----|-----|
| Gln Arg Ala Pro Ser Ser Lys Gln Val Asn Gly Val Gln Lys Gln Arg |     |     |
| 145   | 150 | 155 |
| Arg Leu Ala Ala Asn Ala Arg Glu Arg Arg Arg Met His Gly Leu Asn |     |     |
|   | 165 | 170 |
| His Ala Phe Asp Gln Leu Arg Asn Val Ile Pro Ser Phe Asn Asn Asp |     |     |
|   | 180 | 185 |
| Lys Lys Leu Ser Lys Tyr Glu Thr Leu Gln Met Ala Gln Ile Tyr Ile |     |     |
|   | 195 | 200 |
| Asn Ala Leu Ser Glu Leu Leu Gln Thr Pro Ser Gly Gly Glu Gln Pro |     |     |
|   | 210 | 215 |
| Pro Pro Pro Pro Ala Ser Cys Lys Ser Asp His His His Leu Arg Thr |     |     |
|   | 225 | 230 |
| Ala Ala Ser Tyr Glu Gly Gly Ala Gly Asn Ala Thr Ala Ala Gly Ala |     |     |
|   | 245 | 250 |
| Gln Gln Ala Ser Gly Gly Ser Gln Arg Pro Thr Pro Pro Gly Ser Cys |     |     |
|   | 260 | 265 |
| Arg Thr Arg Phe Ser Ala Pro Ala Ser Ala Gly Gly Tyr Ser Val Gln |     |     |
|   | 275 | 280 |
| Leu Asp Ala Leu His Phe Ser Thr Phe Glu Asp Ser Ala Leu Thr Ala |     |     |
|   | 290 | 295 |
| Met Met Ala Gln Lys Asn Leu Ser Pro Ser Leu Pro Gly Ser Ile Leu |     |     |
|   | 305 | 310 |
| Gln Pro Val Gln Glu Glu Asn Ser Lys Thr Ser Pro Arg Ser His Arg |     |     |
|   | 325 | 330 |
| Ser Asp Gly Glu Phe Ser Pro His Ser His Tyr Ser Asp Ser Asp Glu |     |     |
|   | 340 | 345 |

Ala Ser

<210> 59  
 <211> 485  
 <212> DNA  
 <213> CHICKEN

<220>  
 <221> misc\_feature  
 <222> (147)..(147)  
 <223> "n" can be any nucleotide

|   |     |
|---|-----|
| <400> 59  |     |
| ccgctgctgg ggccggacgg ggcggctgcg gcttcgcccc cggctggctg ggcgtgtgct | 60  |
| gcgccgcacg cgtgcccgcc gcgtgcgccg gctacctgct gcccgccgac gaggaggacg | 120 |
| aggcggcccc tggcgggggg cgcggnccgc gttccggcgg gagcagcccc gggggagcgc | 180 |

ggggcggcgg cgggcgcgcg gggcggcggc ggcggggccg ggccgcgggc gcaggtgagc 240  
 ggcgtgcaga agcagcgggc gctggcggcc aacgcgcggg agcggcggcg gatgcacggg 300  
 ctgaaccacg ccttcgacca gctgcgtaat gtcatcccct ccttcaacaa cgacaagaag 360  
 ctctccaagt acgagacgct gcagatggcg caaatctaca tcagcgccct cgccgagctg 420  
 ctgcacgggc cgcccgcgcc ccccgagccg cccgccaagg ccgagctccg cggggccccc 480  
 ttcga 485

<210> 60  
 <211> 161  
 <212> PRT  
 <213> CHICKEN

<400> 60

Pro Leu Leu Gly Pro Asp Gly Ala Ala Ala Ala Ser Pro Pro Ala Gly  
 1 5 10 15  
 Trp Ala Cys Ala Ala Pro His Ala Cys Pro Pro Arg Arg Arg Ala Thr  
 20 25 30  
 Cys Cys Pro Pro Thr Arg Arg Thr Arg Arg Pro Val Ala Gly Gly Ala  
 35 40 45  
 Ala Arg Val Pro Ala Gly Ala Ala Pro Gly Glu Arg Gly Ala Ala Ala  
 50 55 60  
 Gly Ala Arg Gly Gly Gly Gly Gly Ala Gly Pro Arg Ala Gln Val Ser  
 65 70 75 80  
 Gly Val Gln Lys Gln Arg Arg Leu Ala Ala Asn Ala Arg Glu Arg Arg  
 85 90 95  
 Arg Met His Gly Leu Asn His Ala Phe Asp Gln Leu Arg Asn Val Ile  
 100 105 110  
 Pro Ser Phe Asn Asn Asp Lys Lys Leu Ser Lys Tyr Glu Thr Leu Gln  
 115 120 125  
 Met Ala Gln Ile Tyr Ile Ser Ala Leu Ala Glu Leu Leu His Gly Pro  
 130 135 140  
 Pro Ala Pro Pro Glu Pro Pro Ala Lys Ala Glu Leu Arg Gly Ala Pro  
 145 150 155 160  
 Phe

<210> 61  
 <211> 138  
 <212> DNA  
 <213> PUFFER FISH

<400> 61  
 gcggcgaacg cgagggagag gaggagaatg cacggcctga ataaagcgtt tgacgaactg 60



aggagcgtca ttccttcocct ggaaaatgag agaaagctct ccaagtatga cactctccag 120  
 atggcccaaa cctacatc 138

<210> 62  
 <211> 46  
 <212> PRT  
 <213> PUFFER FISH

<400> 62

Ala Ala Asn Ala Arg Glu Arg Arg Arg Met His Gly Leu Asn Lys Ala  
 1 5 10 15  
 Phe Asp Glu Leu Arg Ser Val Ile Pro Ser Leu Glu Asn Glu Arg Lys  
 20 25 30  
 Leu Ser Lys Tyr Asp Thr Leu Gln Met Ala Gln Thr Tyr Ile  
 35 40 45

<210> 63  
 <211> 1477  
 <212> DNA  
 <213> DROSOPHILA

<400> 63

atcatcttgt tagcggcctt agagccgaat cgttttctag cgccatttta agctcgcaac 60  
 gaactgaggt ataaccgggc tctctgagac cgctgcaact caccaccaac tgccattggt 120  
 cgtgccactc gggcgggaac tctctgacac tctggcaact cgtttacctg cccccctacc 180  
 tgcctttcag gcccttctga ccgtcgttgt ggatttgtga gtataaatag ggccgaaagg 240  
 acgagagacc agtcagaaac ccgccagcac tcgcagcgtt cgtatcggtt catccagcaa 300  
 cataacacca ccatacagca gcagcaacat gtcgtccagt gagatctatc gctactacta 360  
 caagacctcc gaggacttgc agggttcaa gacagccgcc gccgagccgt acttcaatcc 420  
 catggcagcc tacaatcccg gcgtgaccca ctaccagttc aatggcaaca ccctggccag 480  
 cagcagcaac tacttgctcg ccaatggctt catcagcttc gagcaggcca gttccgatgg 540  
 ctggatctcc tctcgcgcgg ctagccaccg atctgagagt cccgagtatg tggatctcaa 600  
 taccatgtac aatggagggt gcaacaacat ggcccagaac caacaatacg gaatgattat 660  
 ggagcagtct gttgtttcca cagcgcctgc aattccagtg gcctctctc cggcagtgga 720  
 ggtcatgggc tcctccaacg tgggcacttg caaacgatt ccagcctcag cagctccgaa 780  
 accgaagcgt agctatacca agaagaacca gccaaagcacc accgccacct ccacaccgac 840  
 tgcagctgcg gagtcatctg cctcagtga tctctacacg gaggagttcc agaactttga 900  
 ctttgacaac tccgccttgt tcgatgacag cgtcgaggat gacgaggacc tcatgctctt 960  
 cagtggcggg gaggacttcg atggcaatga tggatccttt gacttggccg atggtgagaa 1020

ccaagatgcc gctgccggag gctctggaaa gaagaggcgt ggcaagcaga tcacaccgct 1080  
cgtgaagagg aagcgtcgcc tggccgccaa tgcacgtgag cgtcgtcgga tgcagaacct 1140  
caaccaggcc ttcgatcgtc tccgccagta ccttcctgt ctgggaaacg atcgccagct 1200  
gtccaaacac gagaccctcc aaatggccca gacctacata tccgctctcg gggatctgct 1260  
gcgctgaatt cccggatccc gatcccagtc ccaagtacta ttctcagtta ttgttgagc 1320  
ttgccaaatg ttgtagctac tttgtatata ttgcctggag cccagtagtg aattaccgct 1380  
taagtattat gctgtttatt gtttagttaa ttagcctaaa tggaagacaa tgattaagac 1440  
taaggaagac aaaataaaaag caccattaat aatttaa 1477

<210> 64  
<211> 312  
<212> PRT  
<213> DROSOPHILA

<400> 64

Met Ser Ser Ser Glu Ile Tyr Arg Tyr Tyr Tyr Lys Thr Ser Glu Asp  
1 5 10 15  
Leu Gln Gly Phe Lys Thr Ala Ala Ala Glu Pro Tyr Phe Asn Pro Met  
20 25 30  
Ala Ala Tyr Asn Pro Gly Val Thr His Tyr Gln Phe Asn Gly Asn Thr  
35 40 45  
Leu Ala Ser Ser Ser Asn Tyr Leu Ser Ala Asn Gly Phe Ile Ser Phe  
50 55 60  
Glu Gln Ala Ser Ser Asp Gly Trp Ile Ser Ser Ser Pro Ala Ser His  
65 70 75 80  
Arg Ser Glu Ser Pro Glu Tyr Val Asp Leu Asn Thr Met Tyr Asn Gly  
85 90 95  
Gly Cys Asn Asn Met Ala Gln Asn Gln Gln Tyr Gly Met Ile Met Glu  
100 105 110  
Gln Ser Val Val Ser Thr Ala Pro Ala Ile Pro Val Ala Ser Pro Pro  
115 120 125  
Ala Val Glu Val Met Gly Ser Ser Asn Val Gly Thr Cys Lys Thr Ile  
130 135 140  
Pro Ala Ser Ala Ala Pro Lys Pro Lys Arg Ser Tyr Thr Lys Lys Asn  
145 150 155 160  
Gln Pro Ser Thr Thr Ala Thr Ser Thr Pro Thr Ala Ala Ala Glu Ser  
165 170 175  
Ser Ala Ser Val Asn Leu Tyr Thr Glu Glu Phe Gln Asn Phe Asp Phe  
180 185 190

Asp Asn Ser Ala Leu Phe Asp Asp Ser Val Glu Asp Asp Glu Asp Leu  
 195 200 205  
 Met Leu Phe Ser Gly Gly Glu Asp Phe Asp Gly Asn Asp Gly Ser Phe  
 210 215 220  
 Asp Leu Ala Asp Gly Glu Asn Gln Asp Ala Ala Ala Gly Gly Ser Gly  
 225 230 235 240  
 Lys Lys Arg Arg Gly Lys Gln Ile Thr Pro Val Val Lys Arg Lys Arg  
 245 250 255  
 Arg Leu Ala Ala Asn Ala Arg Glu Arg Arg Arg Met Gln Asn Leu Asn  
 260 265 270  
 Gln Ala Phe Asp Arg Leu Arg Gln Tyr Leu Pro Cys Leu Gly Asn Asp  
 275 280 285  
 Arg Gln Leu Ser Lys His Glu Thr Leu Gln Met Ala Gln Thr Tyr Ile  
 290 295 300  
 Ser Ala Leu Gly Asp Leu Leu Arg  
 305 310

<210> 65  
 <211> 907  
 <212> DNA  
 <213> FROG

<400> 65  
 gccccggggc cactctgcgc acttgtcggg acttattcgc acttacctgt catggcccg 60  
 ctgctacacg gcgctgctac tgccgctgac tgggtgcgagc tgaaggagct tccatccgag 120  
 gccgggctct tggccagaga ttacctacta gacagcagcg acccccgcgc ctggctctcc 180  
 gccacttccc tgcaaagtcg ccctgagtac gtgctgcacc ccccgggccg ggccggggcg 240  
 acaaggtgcg ggaactgtgc aaactgaagg ggctgcggga tgatgatgat gatgaggagg 300  
 atgatgagga ggaggaagag agatccgagg ggctgtgcag acacaggggt cccctggca 360  
 agggccctgg tggggttcag aagcagagga gactggcagc caatgccagg gagaggagga 420  
 ggatgcacgg gctcaatcat gccttcgatc agctccgtaa tgtcatccct tccttcaata 480  
 acgacaagaa actctccaaa tacgagaccc tgcagatggc tcagatctac atcaacgccc 540  
 tgtccgacct gctgcaggcg ccccccgact ccagagatcc cccctgcccg cccacctacc 600  
 aactgcattc ggggccagag cccagggttag tccagtctgg cagcatgaga ttctcggaga 660  
 cttccccccg acagtcccc ctcagccaat tccaggaggg agctgctccc agaagggaat 720  
 aggatctggg cccatcttca tcttctcggg aagacatcgc ccatcttcat cttcggggag 780  
 aagacagcaa gacatcgcaa gatctcatcg gactgacggc gaattccggg ctccctatag 840  
 tgagtcgtat taatttcgat aagccagctg cattaatgaa tcggccaaac gcgcggggag 900  
 aggcgggt 907

<210> 66  
<211> 259  
<212> PRT  
<213> FROG

<400> 66

|     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |     |
|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Met | Ala | Arg | Leu | Leu | His | Gly | Ala | Ala | Thr | Ala | Ala | Asp | Trp | Cys | Glu |
| 1   |     |     | 5   |     |     |     |     |     | 10  |     |     |     |     | 15  |     |
| Leu | Lys | Glu | Leu | Pro | Ser | Glu | Ala | Gly | Leu | Leu | Ala | Arg | Asp | Tyr | Leu |
|     |     | 20  |     |     |     |     |     | 25  |     |     |     |     | 30  |     |     |
| Leu | Asp | Ser | Ser | Asp | Pro | Arg | Ala | Trp | Leu | Ser | Ala | Thr | Ser | Leu | Gln |
|     |     | 35  |     |     |     |     | 40  |     |     |     |     | 45  |     |     |     |
| Ser | Arg | Pro | Glu | Tyr | Val | Leu | His | Pro | Pro | Gly | Arg | Ala | His | Lys | Val |
|     | 50  |     |     |     |     | 55  |     |     |     |     | 60  |     |     |     |     |
| Arg | Glu | Leu | Cys | Lys | Leu | Lys | Gly | Leu | Arg | Asp | Asp | Asp | Asp | Asp | Glu |
| 65  |     |     |     | 70  |     |     |     |     |     | 75  |     |     |     |     | 80  |
| Glu | Glu | Asp | Asp | Glu | Glu | Glu | Glu | Glu | Arg | Ser | Glu | Gly | Leu | Cys | Arg |
|     |     |     | 85  |     |     |     |     |     | 90  |     |     |     |     | 95  |     |
| His | Arg | Gly | Pro | Pro | Gly | Lys | Gly | Pro | Gly | Gly | Val | Gln | Lys | Gln | Arg |
|     |     |     | 100 |     |     |     |     | 105 |     |     |     |     | 110 |     |     |
| Arg | Leu | Ala | Ala | Asn | Ala | Arg | Glu | Arg | Arg | Arg | Met | His | Gly | Leu | Asn |
|     |     | 115 |     |     |     |     | 120 |     |     |     |     | 125 |     |     |     |
| His | Ala | Phe | Asp | Gln | Leu | Arg | Asn | Val | Ile | Pro | Ser | Phe | Asn | Asn | Asp |
|     | 130 |     |     |     |     | 135 |     |     |     |     | 140 |     |     |     |     |
| Lys | Lys | Leu | Ser | Lys | Tyr | Glu | Thr | Leu | Gln | Met | Ala | Gln | Ile | Tyr | Ile |
| 145 |     |     |     | 150 |     |     |     |     |     | 155 |     |     |     |     | 160 |
| Asn | Ala | Leu | Ser | Asp | Leu | Leu | Gln | Ala | Pro | Pro | Asp | Ser | Arg | Asp | Pro |
|     |     |     | 165 |     |     |     |     |     | 170 |     |     |     |     | 175 |     |
| Pro | Cys | Pro | Pro | Thr | Tyr | Gln | Leu | His | Ser | Gly | Pro | Glu | Pro | Arg | Leu |
|     |     |     | 180 |     |     |     |     | 185 |     |     |     |     | 190 |     |     |
| Val | Gln | Ser | Gly | Ser | Cys | Met | Arg | Phe | Ser | Gly | Asp | Phe | Pro | Gly | Gln |
|     |     | 195 |     |     |     |     | 200 |     |     |     |     | 205 |     |     |     |
| Ser | Pro | Leu | Ser | Phe | Gln | Phe | Gln | Glu | Gly | Ala | Ala | Leu | Ser | Gly | Lys |
|     | 210 |     |     |     |     | 215 |     |     |     |     | 220 |     |     |     |     |
| Gly | Ile | Gly | Ser | Ala | Pro | Ser | Ser | Ser | Ser | Gly | Glu | Asp | Ser | Lys | Thr |
| 225 |     |     |     |     | 230 |     |     |     |     | 235 |     |     |     |     | 240 |
| Ser | Pro | Arg | Ser | His | Arg | Ser | Asp | Gly | Glu | Phe | Arg | Ser | Pro | Tyr | Ser |
|     |     |     |     | 245 |     |     |     |     | 250 |     |     |     |     | 255 |     |
| Glu | Ser | Tyr |     |     |     |     |     |     |     |     |     |     |     |     |     |

<210> 67

<211> 19  
<212> DNA  
<213> SYNTHETIC CONSTRUCT

<400> 67  
tgaagctttt ggctttgag

19

<210> 68  
<211> 19  
<212> DNA  
<213> SYNTHETIC CONSTRUCT

<400> 68  
ccgctgccaa attcttttg

19

<210> 69  
<211> 37  
<212> DNA  
<213> HUMAN

<400> 69  
gggggcactg acagtaatgc atgccgtatt cgaagtt

37